

# Getting Started with Open Educational Resources



# GETTING STARTED WITH OPEN EDUCATIONAL RESOURCES

A guide for University of Iowa  
OpenHawks recipients

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Welcome! This book is intended to help guide University of Iowa faculty and students working with Open Educational Resources (**OER**), whether you're getting ready to use an OER for the first time, adapting or remixing existing OER, creating your own, or some combination of these things.

This guide is itself an OER. It uses the Pressbooks platform and is licensed to be reused by anyone, anywhere, in any way. Like many open books, it contains lightly adapted remixes of existing open works. These include material from The Creative Commons' CC Certificate Resources, Chapter 5: Creative Commons For Educators (Chapters 1-3, 13, and 14), the Accessibility Toolkit – 2nd Edition by BCcampus (Chapters 7-13), The OER Starter Kit by Abbey K. Elder (Chapter 6), “Showing Students Their Stories Matter” by Justine Hope Blau (Chapter 6) and Pressbooks User Guide by Book Oven Inc. (Pressbooks.com) (Chapter 4). I would invite you to check out the originals for additional helpful content.

As always, if you have any questions about this resource or anything else related to OER at Iowa, please feel free to contact me (Mahrya Burnett).





# PART I USING OER



## 1.

# OER, OPEN TEXTBOOKS, AND OPEN COURSES

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Open education is an idea, as well as a set of content, practices, policy, and community which, properly leveraged, can help everyone in the world access free, effective, open learning materials for the marginal cost of zero.<sup>1</sup> For the first time in history, educators around the world can create, open, and share high quality, effective learning materials with everyone who wants to learn. The key to this transformational shift in learning is Open Educational Resources (OER). OER are education materials that are shared at no cost with legal permissions for the public to freely use, share, and build upon the content.

OER are possible because:

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1. This chapter is adapted from The Creative Commons' CC Certificate Resources, Chapter 5: Creative Commons For Educators, published under a Creative Commons Attribution 4.0 International License.

- education resources are (mostly) born digital<sup>2</sup> and digital resources can be stored, copied, and distributed for near zero cost;
- the internet makes it simple for the public to share digital content; and
- Creative Commons licenses make it simple and legal to retain copyright and legally share educational resources with the world.

Because we can share effective education materials with the world for near zero cost<sup>3</sup>, many people argue that educators and governments who support public education have a moral and ethical obligation to do so. This argument roots in the premise that education is fundamentally about sharing knowledge and ideas. Creative Commons believes OER will replace much of the expensive, proprietary content used in academic courses. Shifting to this model will generate more

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2. Most OER are “born” digital, though OER can be made available to learners in both digital and printed formats. Of course, digital OER are easier to share, modify, and redistribute, but being digital is not what makes something an OER or not.
  3. While in many countries (like in many EU member states), cost may not be a problem, restrictive copyright and narrow fair use / fair dealing rights can limit new teaching methods.

equitable economic opportunities and social benefits globally without sacrificing quality of education content.

## Big Question/Why It Matters

Does it seem reasonable that education in the age of the internet should be more expensive and less flexible than it was in previous generations? As people and knowledge are increasingly networked and available online, what will it mean for learning, work, and society?

As economies become increasingly global and networked, the skills and knowledge required to successfully acquire and keep good jobs require a higher education. All national governments invest in and have strategic goals for how their public education systems can support individuals, families, and the broader society.

While many interesting and useful experiments are occurring outside formal education, the degrees, certificates, and other credentials awarded by formal institutions are still critically important to the quality of life of many people around the world.



### Open Educational Resources: The Education Ecosystem Comes to Life by opensourceway CC BY-SA 2.0

As noted, formal education, even in the age of the internet, can be more expensive and less flexible than ever. In many countries, publishers of education materials overcharge for textbooks and other resources. As part of their transition from print to digital, these same companies have largely moved away from a model where learners purchase and own books to a “streaming” model where they have access for a limited time.

Further, publishers are constantly developing restrictive technologies that limit what learners and faculty can do with the resources they have temporary access to, including inventing novel ways to prohibit printing, prevent cutting and pasting, and restrict the sharing of materials between friends.

## Learning Outcomes

- Define “open” in the context of open educational resources (OER)
- Differentiate between OER, open textbooks, open courses, and MOOCs

## Personal Reflection: Why it Matters to You

What impacts have the rising costs and decreased flexibility of education materials had on you and those you know? What role do you imagine all-rights-reserved copyright and related laws have played in driving up costs and driving down flexibility for learners and teachers?

# Acquiring Essential Knowledge

## OER and OER Textbooks

To begin, watch this video: Why OER? (Time: 3:48)

Open Educational Resources (OER) are teaching, learning and research materials in any medium that reside in the public domain or have been released under an open license that permits no-cost access, use, adaptation and redistribution by others<sup>4</sup>

Or you could use this less technical definition to describe OER to someone:

OER are education materials that can be freely downloaded, edited, and shared to better serve all students<sup>5</sup>

In contrast to traditional education materials, which are

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4. Creative Commons adaptation of the UNESCO OER definition:  
[http://www.unesco.org/new/en/communication-and-information/  
access-to-knowledge/open-educational-resources](http://www.unesco.org/new/en/communication-and-information/access-to-knowledge/open-educational-resources)

5. Drafted by OER Communications: a coalition of North American open education advocates working on OER communication: [oer-comms@googlegroups.com](mailto:oer-comms@googlegroups.com)



constantly becoming more expensive and less flexible, OER provide everyone, everywhere, free permission to download, edit, and share them with others. David Wiley provides another popular definition, stating that only education materials licensed in a manner that provide the public with permission to engage in the 5R activities can be considered OER.

The 5Rs include:

1. **Retain** – permission to make, own, and control copies of the content (e.g., download, duplicate, store, and manage)
2. **Reuse** – permission to use the content in a wide range of ways (e.g., in a class, in a study group, on a website, in a video)
3. **Revise** – permission to adapt, adjust, modify, or alter the content itself (e.g., translate the content into another language)
4. **Remix** – permission to combine the original or revised content with other material to create something new (e.g., incorporate the content into a mashup)
5. **Redistribute** – permission to share copies of the original content, your revisions, or your remixes with others (e.g., give a copy of to a friend)

The easiest way to confirm that an education resource is an \*open\* education resource that provides you with the 5R

permissions is to determine that the resource is either in the public domain or has been licensed under a Creative Commons license that permits the creation of derivative works – CC BY, CC BY-SA, CC BY-NC, or CC BY-NC-SA.

OER come in all shapes and sizes. A piece of OER can be as small as a single video or simulation and can be as large as an entire degree program. It can be difficult, or at least time consuming for teachers to assemble OER into a collection comprehensive enough to replace an all rights reserved copyright textbook. For this reason, OER are often collected and presented in ways that resemble a traditional textbook in order to make them easier for instructors to understand and adopt.

The term “open textbook” simply means a collection of OER that have been organized to look like a traditional textbook in order to ease the adoption process. To see examples of open textbooks in a number of disciplines, visit OpenStax, the Open Textbook Library, or the BC Open Textbook Project.

Other times, OER are aggregated and presented as digital courseware. To see examples of open courseware, visit the Open Education Consortium and MIT OCW.

In addition to demonstrating that learners save money when their teachers adopt OER, research shows that learners can have better outcomes when their teachers choose OER instead

of education materials available under all rights reserved copyright.

The idea of OER is strongly advocated by a broad range of individuals, organizations, and governments, as evidenced by documents like the Cape Town Open Education Declaration (2007) and Cape Town +10 (2017), the UNESCO Paris OER Declaration (2012), UNESCO Ljubljana OER Action Plan (2017), and the UNESCO OER Recommendation (in draft, as of December 2018).

## OER v. Free Library Resources

Teachers and professors typically use a mix of all-rights-reserved commercial content, free library resources, and OER in their courses. While the library resources are “free” to the learners and faculty at that institution, they are (a) not “free” as the institution’s library has to pay to purchase or subscribe to them, and (b) not available to the general public. This chart describes the cost to learners and the legal permissions available to teachers and learners for each of these types of educational resources.

	Cost to Students	Permissions to Teachers and Students
<b>Commercial Textbooks</b>	<b>Expensive</b>	<b>Restrictive</b>
<b>Library Resources</b>	<b>Free</b>	<b>Restrictive</b>
<b>Open Educational Resources</b>	<b>Free</b>	<b>5Rs</b>

Affordability Matrix shows cost and permissions information for commercial textbooks, library resources, and OER. David Wiley. Slide. CC BY 4.0

## Open Educational Resources (A Very Brief Timeline)

While there isn't enough space in this Certificate give a comprehensive overview of the "History of Open Education," here are several of the pivotal events that contributed to the growth of the open education movement. (If you know of additional critical events to include, please tell us and we will update the timeline. Thanks!)

- 1969 – UK Open University opens

- 1983 – Free software movement founded with launch of GNU
- 1989 – World Wide Web begins
- 1997 – MERLOT begins
- 1998 – U.S. Copyright Term Extension Act passed
- 1998 – “Open content” term is coined and Open Content License released
- 1999 – Open Publication License released
- 1999 – Connexions launches (renamed OpenStax in 2012)
- 2001 – Wikipedia founded
- 2001 – Creative Commons founded
- 2001 – MIT Courseware launched
- 2002 – Budapest Open Access Initiative
- 2002 – Creative Commons licenses launched
- 2002 – UNESCO coined the name Open Educational Resources
- 2004 – First annual Open Education Conference
- 2005 – OpenCourseWare Consortium formed (renamed the Open Education Consortium in 2014)
- 2006 – WikiEducator begun
- 2007 – Cape Town OER Declaration
- 2007 – OER Commons started
- 2007 – Wiley and Couros experiment with “open courses”
- 2008 – Opening Up Education published
- 2008 – Connectivism and Connected Knowledge (2000

learners participated, leading to the term “massive open online course” or MOOC. Watch this video describing MOOCs: “What is a MOOC?” video (4:26) by Dave Cormier, CC BY 3.0)

- 2012 – OpenStax releases first open textbook
- 2012 – UNESCO OER Paris Declaration
- 2013 – OERu launched
- 2017 – UNESCO 2nd World OER Congress
- 2018 – UNESCO drafted an OER Recommendation

## Final Remarks

OER, whether organized as open textbooks or open courseware, provide teachers, learners, and others with a broad range of permissions that make education more affordable and more flexible. These permissions also enable rapid, low-cost experimentation and innovation, as educators seek to maximize access to effective educational resources for all.

## 2.

# FINDING, EVALUATING, AND ADAPTING RESOURCES

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Teachers have always created and shared teaching materials, though finding and reusing others' work is not always simple.<sup>1</sup> This chapter will teach you how to find free and openly licensed teaching resources that already exist and adapt them for use in your own classrooms.

## Why It Matters

If you're going to find the best open resources for your course, and share your work as OER, and join an OER community of

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1. This chapter is adapted from The Creative Commons' CC Certificate Resources, Chapter 5: Creative Commons For Educators, published under a Creative Commons Attribution 4.0 International License.

practice, you need to know how to find, evaluate, and adapt openly licensed resources. And what if we want to think bigger, what effect might open education have globally?

How is the openness, the opportunity to revise, remix and share, of content potentially impactful on a global scale? If the public had access to and could creatively remix the world's knowledge, what new opportunities might we find to address global challenges (e.g., United Nations Sustainable Development Goals)

### Learning Outcomes

- Find OER in open repositories, Google, CC Search, and other platforms
- Evaluate how to reuse, revise, and remix the OER you find
- Demonstrate how different OER can be used together, paying attention to license compatibility.



## Personal Reflection: What it Matters to You

Where do you currently find your learning resources? Do you seek open alternatives for materials you currently use? How do you evaluate your existing learning resources, and how can you apply those measures to openly licensed content?<sup>2</sup>

Once you identify the learning resources you currently use, ask yourself the following questions:

- Is this resource available to all of my learners at no cost?
- Can my learners and I keep a copy of this resource forever?
- Does my class have the legal rights to fix errors, update old or inaccurate content, improve the work, and share it with other educators around the world?

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2. This worksheet from University of Iowa's OpenHawks program can help with evaluating the OER you find.

- Can my learners contribute to and improve our learning resources as part of their course work?

If the answer to these questions is “No,” you’re likely using learning resources that don’t provide the legal permissions you and your learners need to do what you want to do. Conversely, if you answered “Yes” to all of the questions, you are likely using OER.

## Acquiring Essential Knowledge

### Finding Resources

Not everything on the internet is OER, and some works labeled as “open” may not have the legal permissions to exercise the 5Rs. So how do you recognize OER and how do you choose which OER will work best in your class? Remember that for a resource to be an OER it has to be available to everyone at no cost and be in the public domain or under an open license.

Finding the resources you want to use is the first step to bringing OER into your classroom. Discovery is one of the

primary barriers to educators using OER. Fortunately, there are many established ways to search for OER.

First, for a short introduction on how to find OER, watch this video:

<https://youtube.com/watch?v=NJRlaQkiWKw>

If you want to know more about most popular general options for searching for OER, you might consider reading through this Open Washington course module.

## OER Repositories and Search Tools

There are many websites that host large collections of OER (e.g., Wikimedia Commons), but some universities host their own OER repositories and services. A good first step is to do a general OER search using Google Advanced Search and filter your results by “Usage Rights” (pull-down menu at the bottom of the screen). See Google’s post on how to use the tool effectively.

There are also hundreds of online platforms on which you can share your openly licensed content. Creative Commons maintains a directory of some of the most popular OER platforms used by educators organized by content type (photos, video, audio, textbooks, courses, etc.), and here are a handful of largest, most often used OER search tools and repositories:

- OER Commons
- OASIS Metafinder
- Open Textbook Library

Try searching several different platforms and meta-search tools to find the greatest number of results to choose from.

## Listservs and Google Groups

Open educators often ask each other for help when looking for OER on email listservs and Google Groups. Here are a few you might want to join:

- SPARC LibOER
- Community College Consortium for Open Educational Resources (CCCOER) Google Group
- Creative Commons Open Education Platform Mailing List
- Iowa OER Google Group

## Openly Licensed Images

As you begin to use and create OER, remember that the images you use should be free and openly licensed, as well. Here are some sources you might consider for openly licensed images:

- Creative Commons CC Search

- Library of Congress Flickr Account
- The Met Collection
- Unsplash
- The Noun Project
- Nappy: Beautifully Diverse Stock Photos

## Evaluating Sources

Just like any other teaching resources, you need to carefully evaluate the OER you plan on using in your teaching. Educators who are new to OER may have concerns about quality because OER are available for free and may have been remixed by other educators. The process of using and evaluating OER is not that different from evaluating traditional all-rights-reserved copyright resources. Whether education materials are openly licensed or closed, you are the best judge of quality because you know what your learners need and what your curriculum demands.

Subject specialists (educators and librarians) assess the quality and suitability of learning resources, often along the following criteria<sup>3</sup>:

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3. Adapted from Open Textbooks Review Criteria from the Open Textbook Network: <https://open.umn.edu/opentextbooks/reviews/rubric>

<b>Comprehensiveness</b>	Does it look like it covers the topic thoroughly and completely?
<b>Accuracy</b>	Do you notice any errors or inaccuracies?
<b>Relevance</b>	Does it fit your objectives?
<b>Longevity</b>	Will this resource remain relevant for a sufficient period of time?
<b>Clarity</b>	Will it be readable and easy to understand for your students?
<b>Consistency</b>	Does the OER have a unified style, perspective, and content?
<b>Modularity</b>	Can you easily change the order of chapters or sections, or delete sections entirely, and still have the work make sense?
<b>Organization/ Structure/Flow</b>	Is the OER organized well into sections, headings, and chapters? Does the structure assist with accessibility? Does the content follow a logical progression?
<b>Interface</b>	How easy is the resource to use and navigate?
<b>Grammatical Errors</b>	Does the work seem like it was proofread?
<b>Cultural Relevance</b>	Who is this work speaking to? Who is it leaving out?

And be careful not to let anyone tell you OER are “low

quality” because they are free. As the SPARC OER Mythbusting Guide points out:

- In this increasingly digital and internet connected world, the old adage of “you get what you pay for” is growing outdated. New models are developing across all aspects of society that dramatically reduce or eliminate costs to users, and this kind of innovation has spread to education resources.
- OER publishers have worked to ensure the quality of their resources. Many open textbooks are created within rigorous editorial and peer-review guidelines, and many OER repositories allow faculty to review (and see others’ reviews of) the material. There is also a growing body of evidence that demonstrates that OER can be both free of cost and high quality—and more importantly, support positive student learning outcomes.

Also, be careful not to get pulled into a debate about “high or low quality education resources,” when what educators should really be concerned about is “effectiveness.” Read these two posts from David Wiley: [Stop Saying “High Quality”](#) and [No, Really – Stop Saying “High Quality.”](#)

## Remixing and Adapting Resources

Openly licensing learning materials enables educators to use

the materials more effectively, which can lead to better learning and student outcomes. OER can be remixed and adapted, updated, tailored and improved locally to fit the needs of learners by translating the OER into a local language, adapting a biology open textbook to align it with local science standards, or modifying an OER simulation to make it accessible for a student who cannot hear.

The ideas of remix and adaptation are fundamental to education. Creative reuse of materials created by other educators and authors is about more than just seeking inspiration; we copy, adapt, and combine different materials to craft education resources for our learners.



Photo by José Carlos Cortizo Pérez. CC BY 2.0

Incorporating materials created by others and combining



materials from different sources can be tricky, not only from a pedagogical perspective, but also from a copyright perspective.

Online digital education resources have different legal permissions that empower (or not) the public to use, remix and share those resources. Here are a few of those legal categories:

- **Public domain works** (not restricted by **copyright**) can be remixed with any work. For example, anyone can remix the *Adventures of Huckleberry Finn* by Mark Twain with *Alice's Adventures in Wonderland* by Lewis Carroll.
- **All-rights-reserved copyrighted works, available for free online**, which you can only use under the project terms of service, or using an exception or limitation to copyright, such as fair use or fair dealing. For example, many MOOCs allow free reuse of their content, but do not allow copying, revise, remix, or redistribution.
- **All-rights-reserved copyrighted works in closed formats** do not allow the public to remix or adapt a work. For example, a blockbuster movie available only in streaming service that you cannot use or even link to.
- **Creative Commons licensed works (and other free licenses)** that have various permissions and restrictions. For example, Wikipedia (BY-SA) allows you to reuse their content for commercial purposes, while WikiHow (BY-NC-SA) does not. A Wikipedia article cannot be

remixed with a WikiHow article.

If you want to know which CC licensed works can be remixed with other CC licensed works, check out the CC Remix Chart below. Where there is a green check at the intersection of two CC licensed works, you can remix those two works. Where you see a black X, you cannot remix those two CC licensed works.

	✓	✓	✓	✓	✓	✗	✓	✗
	✓	✓	✓	✓	✓	✗	✓	✗
	✓	✓	✓	✓	✓	✗	✓	✗
	✓	✓	✓	✓	✗	✗	✗	✗
	✓	✓	✓	✗	✓	✗	✓	✗
	✗	✗	✗	✗	✗	✗	✗	✗
	✓	✓	✓	✗	✓	✗	✓	✗
	✗	✗	✗	✗	✗	✗	✗	✗

CC License Compatibility Chart / CC BY 4.0

## Final remarks

We live in a world of information abundance, and an increasing percentage of our digital knowledge is openly licensed. Finding the right open resources that fit the needs of your learning spaces and your learners can be a challenge.

One of the major motivations for using OER is the ability to revise, remix, and share these works to best suit the needs of your learners. Search engines, OER repositories and platform services with built-in tools for using Creative Commons licenses help, but finding the right OER still takes time.



## PART II

# CREATING AND SHARING OER



## 3.

## THE BASICS

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The first two chapters introduced us to OER and how to license and use existing material and resources.<sup>1</sup> This unit will explore practices of creating and sharing OER so they can have the biggest impact and be used without any legal or technical barriers.

### Why It Matters

A big part of any educator's work is preparing, updating, and combining learning materials. Making those materials open requires just a few additional steps, and it's easier than you think. What are those steps? What should you consider and

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1. This chapter is adapted from The Creative Commons' CC Certificate Resources, Chapter 5: Creative Commons For Educators, published under a Creative Commons Attribution 4.0 International License.

expect when you want to create and publish your resources in the open?

When we share our education resources as OER, we share our best practices, our expertise, our challenges and solutions. Education is about sharing. When we share our work with more people, we become better educators.

### Learning Outcomes

- Conceptualize how our OER will work in practice
- Understand how to select a CC license(s) for your resources.
- Examine your open license decision for compatibility (i.e., can it be remixed) with other OER.
- Identify needs and challenges to improving OER accessibility for everyone.



### Personal Reflection: Why it Matters to You?

What kind of learning resources do you create now? Are you already publishing and sharing these resources with others for feedback? Which of your resources do you think could benefit fellow educators, learners, libraries or scientists? If you choose to share, how much freedom do you give to others to reuse or borrow from your work; what permissions will you allow for others to reuse your work?

## Acquiring Essential Knowledge

### Why share?

For an introduction on why it is important to share your work as OER, watch this video (time 03:51):



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*excluded from this version of the text. You can view them online here:*  
<https://pressbooks.uiowa.edu/oer-guide/?p=185#oembed-1>

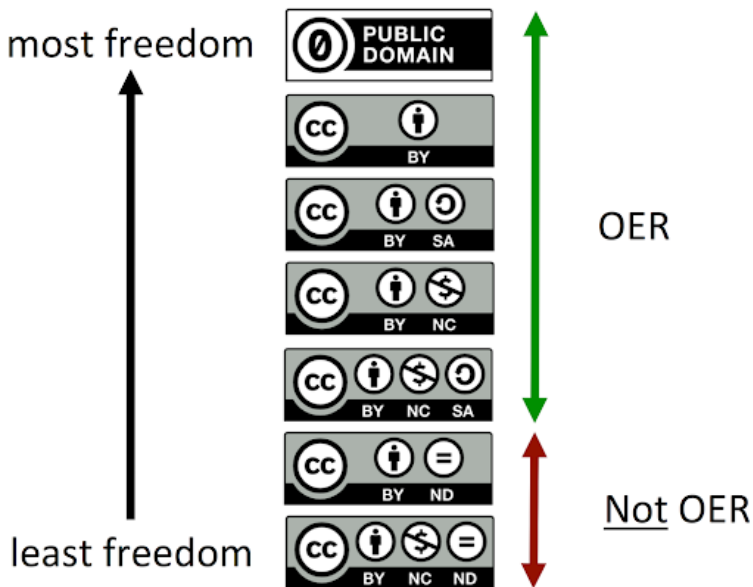
Because educators and librarians can share OER with everyone for near zero cost<sup>2</sup>, we should. After all, education is fundamentally about sharing knowledge and ideas. Libraries are about archiving, sharing, and helping learners find the knowledge they seek. When we license our work and resources under a Creative Commons license, we are sharing that work with the public under simple, legal permissions. Sharing your work expressly with the intention for others to use and share, is a great service and gift to the world.

## Choosing a CC license for OER

Creative Commons has a suite of six open copyright licenses. Creative Commons fully support authors' selection and use of

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2. While in many other countries (like in many EU member states), cost may not be a problem, restrictive copyright and narrow fair use / fair dealing rights can limit new teaching methods.

any of the CC licenses or public domain tools. However, not all education materials available under a CC license are true OER. Some CC licenses are more restrictive than others in how they're created and shared. Review this chart that details which CC licenses work well for education resources and which do not.



Adapted from slides by Cable Green available under CCBY at <http://www.slideshare.com/cgreen>

The two CC No Derivatives (ND) licenses are not technically OER-compatible licenses because they do not allow the public to revise or remix the education resource. Because the ND licenses do not meet the 5Rs or any of the major OER

definitions, the open education movement does not consider ND-licensed education resources “OER”. That said, there are legitimate reasons for not wanting to allow derivatives of your work. The OpenHawks program does allow for ND-licensing on resources created by its grantees, but we ask that you apply these licenses only if you truly want your work to be reused only as-is.

Choosing the right license for your OER requires you to think about which permissions you want to give other users – and which permissions you want to retain for yourself. Read the “Open Textbook Community Advocates CC BY License for Open Textbooks” and think about why they recommend the Creative Commons Attribution License (CC BY) for education. You can find similar text with more arguments made about this same license for publishing scientific research in “Why CC BY?” from Open Access Scholarly Publishers Association.

For basic information about applying a license to your work or others’ work, visit UI Libraries’ OER guide or get started right away and learn how to choose and apply a license with the application tool from Creative Commons.

## Other considerations

Other than choosing the right CC license, consider other aspects of “openness” such as best teaching practices using

OER in the classroom, pedagogical implications of student learning, and assessment of how OER impacts student learning. Here is a list of best practices to include in your work when building OER.

For more practical advice on how to share OER online and prepare OER to be used offline, as well see the Open Washington Module 8 on “Sharing OER.”

## Ensuring OER is accessible to everyone

At its core, OER is about making sure everyone has access. Not just rich people, not just people who can see or hear, not just people who can read English, not just people who have digital devices with access to high-speed internet — everyone!

As authors and institutions build and share OER, best practices in accessibility need to be part of the instructional and technical design from the start. Educators have legal and ethical responsibilities to ensure our learning resources are fully accessible to all learners, including those with disabilities.

Watch “Simply Said: Understanding **Accessibility** in Digital Learning Materials” by the National Center on Accessible Educational Materials (6:42):



*One or more interactive elements has been*



*excluded from this version of the text. You can view them online here:*  
<https://pressbooks.uiowa.edu/oer-guide/?p=185#oembed-2>

Best practices to ensure your OER is accessible to all include:

- putting your work into the public domain (**CC0**) or adding a non-ND CC license to your work,
- make it simple to download your work in editable file formats, so others can modify and/or translate it to meet local needs and make it accessible, and
- most important – design your work to be accessible from the start.

## Final remarks

Openness in education means more than just access or legal certainty over what you are able to use, modify, and share with your learners. Open education means designing content and practices that ensure everyone can actively participate and contribute to the sum of all human knowledge. As educators and learners revise others' OER and create and share new OER, accessibility should always be on your design checklist.

## 4.

## PUBLISHING SUPPORT FOR OPENHAWKS

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As you've seen, OER publishing involves a lot of moving parts. From writing, to formatting, to reviewing, accessibility testing, and piloting, it can feel like you're trying to build the ship while sailing it. But you don't have to do all the work by yourself. The OpenHawks program can help connect you with collaborators, help scope your project into manageable short and long-term goals, assist with peer-review, copyediting, layout and design, and accessibility checking. That's why we're here!

### Project management assistance

During our first check-in meeting, we'll discuss the rough plan for completing your OER. I'll ask you some questions about how you envision your final OER—how will it look, how long will it be, how it will be used in class, who will fill what roles on your team. And you will have a chance to ask any questions you may have, as well. This will help us articulate the long-term

goals of the project and the steps that will need to be taken to get there.

At subsequent check-ins, we'll revisit the goals set at the last meeting, discuss progress made and any issues that may have arisen, talk about next steps, and go over any needs you may have. We'll also talk about any supports you may need.

Below are some specific ways that OpenHawks can support you during your project. If you'd like to take advantage of any of these services, just mention it at your next OpenHawks check-in meeting.

## Finding collaborators

Developing OER usually means working with other people. Some OpenHawks authors come into their project with a team in place and roles already assigned, but most do not. In our early meetings, we will spend some time talking about who else you will need to involve. Will you need to find additional writers, editors, illustrators, videographers, or interviewers? Are there UI departments or offices that might be able to help with a particular issue? Will you need to hire collaborators outside the university? OpenHawks can help answer these questions and facilitate connections.



## Support for alt-text and image captions

As we cover in the accessibility section of this book and at orientation, each image included in your OER should include alt-text that describes the content of the image for those with visual disabilities. Sometimes, charts, figures, and other images that are particularly information-dense may require a full caption or long description to accompany the image. If creating and formatting this text seems daunting, we can create them for you.

## Citation and attribution help

The Americans with Disabilities Act (ADA) requires that government entities (like University of Iowa) make all publicly facing websites (including OER) comply with accessibility standards. That means that the OER we create must use the best practices outlined by the World Wide Web Consortium W3C in its Web Content Accessibility Guidelines, version 2.2. You can find much of this information condensed in the accessibility section of this book, but OpenHawks will also conduct an accessibility check on each OER at the time of project submission.

Formatting goes hand-in-hand with accessibility and involves the structuring of text and other content for

maximum usability. Using the built-in formatting structures found in your authoring tools will go a long way toward producing a well-formatted OER. The Libraries also has a good deal of support for helping with layout, design, and general formatting.

## Book set-up and manuscript import for text-based projects

Most text-based OER is outlined, compiled, and written in Word, Google Docs, LibreTexts, or other familiar word processing tools. Then, when the manuscript is complete, or close to complete, authors import it into their chosen authorship tool to publish it.

This process varies in complexity depending on the amount of multimedia you're using, the numbers of sections and chapters in your OER, the amount of custom formatting required, your level of comfort with HTML text editors, and many other factors.

Rather than manage this all yourself, you can let us handle some or all of it for you. We can import manuscripts into Pressbooks, set up your book template for you, and/or enter your book and chapter level metadata.

## Peer-review facilitation

Before your OER is added to Iowa Research Online, it will need to be peer reviewed by at least two colleagues in your field. Some authors facilitate this themselves by reaching out to other academics in their field of study and asking them to provide feedback.

You can also provide me with the names of potential reviewers, and I can organize the review and feedback for you. Some authors prefer this method as it allows you to focus on writing and revision and removes some of the stress of soliciting and waiting for feedback.

## Copyediting

Even if you've proofread your OER 100 times, you will still need someone to go over the finished product and copyedit it. Beginning in 2024, we will have copyediting and accessibility checks into our standard workflow.

## 5.

## USING PRESSBOOKS

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Pressbooks is a web-authoring tool that can be used to create online books and make them available to readers for free. While there are lots of platforms and tools used to create OER, Pressbooks is a great choice for text-based resources that have the general look and feel of a book. It handles more than just text, though. You can embed or upload media such as images, videos, and web content, and because the platform supports H5P, you can even add interactive content like labs, simulations, quizzes, or anything else you might want to incorporate. Pressbooks is an open-source platform based on WordPress, so if you've ever worked on a WordPress website or blog, the interface will look familiar to you.

At University of Iowa, we have a site license for the platform, which means that if you sign up for an account through the UI Pressbooks site, you'll have access to back-end support from ITS, as well as some additional features. I would encourage anyone thinking of using Pressbooks to sign up through our institution at the link above.

In this chapter, you will learn some tips and basic information about getting started with Pressbooks. This

material is excerpted from Pressbooks User Guide by Book Oven Inc. (Pressbooks.com), which is licensed under a Creative Commons Attribution 4.0 International License. I would recommend that you bookmark this user guide to have as a reference source, particularly if you decide to use the platform for developing your own OER project.

## Quick Start Guide

The guide has a quick start chapter which can help you set up Pressbooks in five steps. Please note that the process for getting an account is a little different for us here at UI, since we have a locally hosted and supported Pressbooks instance. Here are our five steps:

1. Request an account from ITS through this page on their website. The site request form is available here. (Note: This step is different than what is described in the guide.)
2. Add book metadata (i.e., title, author(s), etc.)
3. Add and organize your text
4. Choose your theme
5. Export book

## Book Info

Including robust and accurate information about your book (metadata) allows others to find and use it. From Pressbooks:

“The ‘book info’ page is where you put information about your book. In the book publishing industry, this is called ‘metadata,’ or, data about the data. Metadata allows bookstores and libraries categorize a book and make it easier for readers to find. It answers questions such as: *What is the title? Who is the author? When was it published? And what is the book about?*”

The “book info” section is also where you display your copyright and licensing statement. Near the bottom of the section, you can find a “copyright” area that allows you to choose the appropriate Creative Commons license from a drop-down menu. There is also a textbox that you can use to include attributions for your source material. This can also be included at the chapter level, too. More info on displaying licensing and copyright info can be found in this section of the Book Info page.

For detailed information on entering metadata in Pressbooks, follow the instructions on the Book Info page.

## Parts of a Pressbook

As you are preparing to write and compile the content of your book, it is important to give some thought to how it will be

organized. By default, Pressbooks provides three sections—front matter, main body, and back matter. The dashboard allows you to add, delete, or edit content in each of these three sections. The chapters and most of the substantial content of the book is usually structured into chapters and sub-chapters in the main body.

The Create and Edit Parts section of the guidebook tells you more about working with each section of the Pressbook.

## Adding Content

To add text and media content to your Pressbook, you'll need to use the built-in editor. This allows you to add content in two modes, visual or text.

The visual editor is the default tool. It is a WYSIWYG (What You See Is What You Get) interface that allows you to see styling and formatting as they are applied. You can also work in a text editor, or switch to it as necessary for specific needs. Here, you can view and edit the HTML version of any text written and formatted in the visual editor, and you can also write directly in HTML, using the toolbar as necessary.

The Edit Content with the Visual and Text Editor section of the guidebook tells you more about these features.

## Embedded Media and Interactive Content

From Pressbooks:

“Embedded media is media that is hosted outside of Pressbooks and linked to through your webbook. You will have encountered this kind of content all over the web – YouTube videos in blog posts, for example, or social media posts in news articles. This same kind of media can be dropped into the editor of your webbook on Pressbooks. Your readers can watch videos, take quizzes, view interactive maps, and more without ever leaving the book.”

There are a few different methods to embed media in Pressbooks:

- Copy/paste the URL
- Use a shortcode
- Use the iframe embed code supplied by the content provider

The Display Embedded Media section of the guidebook gives you more information.

## Uploading Media

In addition to embedding content from the source, you can



upload images or other media to be housed in the Pressbook itself. All uploaded media must be under 10 MB. You can upload files from your computer or from a URL, or you can add them first to the Pressbooks media library.

Once you've uploaded an image, you can also control the appearance and placement of image by customizing size and alignment. You'll need to title your image and add alt-tags so that screen readers can display and read all the content properly.

The Media section of the guidebook has more detailed information on how to do this.

## Exporting (Publishing) Your Book

Exporting your book is how you make it available in different formats, so that it can be accessed across different platforms on different types of devices. Besides the default webbook format, Pressbooks supports four different export file formats. The links at the left take you to the part of the guidebook that explains that format more fully.

<b>Print PDF</b>	Export a print PDF file if you plan to publish your book in print format. This file meets the requirements of printers and print-on-demand services.
<b>Digital PDF</b>	Export and download the digital PDF instead if you do not plan on printing the file. These can be used online and can contain hyperlinks for easier navigation.
<b>EPUB</b>	Export EPUBs to submit to any popular ebook distributor. This is the file you'd use to submit your ebook to Amazon, Kobo, Nook, iBooks, and others.

This section of the guide provides step-by-step instructions for exporting your Pressbooks: <https://guide.pressbooks.com/chapter/export/>.

## 6.

## ASSESSING YOUR OER

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### OpenHawks Assessment Guidelines

After your OER project has been completed and used for at least one semester, you should conduct an assessment of the resource's impact and effectiveness. The methods of assessment are up to you, but you should address the following questions:

1. Are students learning what they need to be successful in the course and beyond?
2. Did the OER adequately support the course's curriculum?
3. Did the OER impact the teaching of the course? If so, how?
4. What were students' impressions of the OER?
5. What were instructors' impressions of the OER?
6. What changes need to be made to make this OER more successful going forward?

Information gathering for these questions can be approached in different ways, depending on factors such as available data, type of course, nature of the OER project, disciplinary norms, preferences, etc. Some teams may ask students and instructors directly for feedback on the OER. Others may wish to look closely at student performance data.

We will meet with each project team after the OER has been used for at least one semester to discuss the questions above. We will schedule them well in advance so that you have time to prepare. These meetings will serve two purposes: to gather information about the success of individual projects, and to gather information about the OpenHawks program itself. You may want to write notes, prepare a report, or provide other documentation to support your assessment, but this is not required.

Please also be prepared to provide feedback on the OpenHawks pilot itself. Some questions you may consider: Did you receive adequate support to complete your OER project? Was the cohort beneficial as you worked on your projects? Was the grant amount enough to cover your financial needs for the project?

## Sample Assessment Questions for Students

1. Do you feel that the open textbook used in this course supported your learning? Why or why not?

2. How well did the open textbook align with what was taught in the course?
3. How did the open textbook compare to more traditional textbooks that you have used in other courses?
4. How easy or difficult was it to access and navigate the open textbook?
5. What changes need to be made to make this OER more successful going forward?
6. Any additional comments?



PART III

# ACCESSIBILITY AND INCLUSIVITY





## 7.

# INCLUSIVE OER AND OPEN PEDAGOGY

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As you work on developing OER and integrating it into your teaching, you will need to make sure that what you create is responsive to your students' needs and reflects their voices and realities. It can be difficult to make sure that your resources and instructional practices are inclusive, and it is a process that can be revisited over time. It's never too late or too early to start thinking about making your OER as and as accessible as possible. This chapter combines Abbey Elder's "Diversity and **Inclusion**" chapter from The OER Starter Kit and a case study by Justine Hope Blau.<sup>1</sup>

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1. This first half of this chapter was taken from "Diversity and Inclusion" from The OER Starter Kit by Abbey K. Elder is licensed under a Creative Commons Attribution 4.0 International License, except where otherwise noted.

## Diversity and Inclusion

Adaptability and affordability are two major aspects of what makes an open educational resource attractive to students, but there is another facet that should be considered when you are developing or adapting an OER for your course: perspective. In particular, you should ask yourself how the perspectives being represented in your OER might affect the inclusivity of your course environment.



**WHOSE VOICE IS MISSING?  
AND HOW DO WE INCLUDE  
THOSE VOICES?**

Tara Robertson's 2017 OpenCon talk, "Diversity, Equity, and Inclusion in Open Research and Education" asks whose voices are included in our work and whose are missing.

As Quill West argues in her blog post on diversity and inclusion in open education:

"As important as access is to students and to institutions, it is a starting place for leveraging other benefits of OER, and

I hope that our conversations about [open education] go beyond access, because saving money on materials doesn't address bigger issues in student persistence and completion.”<sup>2</sup>

In this chapter, we will discuss some of the opportunities and drawbacks of using OER to promote inclusivity in your courses.<sup>3</sup>

Merriam-Webster defines diversity as “the inclusion of different types of people (such as people of different races or cultures) in a group or organization.”<sup>4</sup> Diversity is often perceived as an organizational goal or ethical preference: for OER, including diverse perspectives is vital.

Diversity in open education can be achieved by including a variety of sociological perspectives in your open content. Doing this ensures that your students can identify with and relate to your course material. Critical here is ensuring that

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2. West, Quill. “Overview of EDI and Open Education.” *CCCOER blog*, June 28, 2018. <https://www.cccoer.org/2018/06/28/on-equity-diversity-inclusion-and-open-education/>

3. “Diversity & Inclusion” was adapted from Including all students by SUNY OER Services, licensed CC BY 4.0.

4. Merriam-Webster’s Dictionary. “Diversity.” Accessed June 1, 2019. <https://www.merriam-webster.com/dictionary/diversity>

other cultures are presented accurately in your materials, and not according to stereotypes or perceptions based on the standards of your own culture.<sup>5</sup>

Whether intentional or not, ethnocentrism — “a tendency to view alien groups or cultures from the perspective of one’s own” — can creep into the content and presentation of your course materials, and it is something all authors should be aware of. This doesn’t mean you must create course content that accurately portrays and includes all cultures and perspectives; however, you should be respectful toward other people and be aware of your biases as they arise.

One way you can accomplish this is by explicitly acknowledging the perspectives that are included in your content and those which are not. How has your social and cultural background reflected on the work you’ve created? What authors are being cited and acknowledged in your work, and why? Acknowledging that your perspective is limited while including other perspectives in your work can be an incredibly rewarding experience. Some benefits of including diverse perspectives in your course content include:

- 
5. Adding examples from other cultures is a good practice; however, if you don’t know much about the type of people you are “including” in your resource, your inclusion might feel like alienation for students who belong to that group.

- Engaging more students because they recognize themselves or their life experiences in your course content
- Sharing content that appeals to instructors in a variety of educational settings
- Creating a more interesting reading and learning experience for your students and learners around the world

If you aren't certain about how or where to add examples relevant to other cultures, that doesn't mean your resource will never include these perspectives. Thanks to your OER's open license, once your resource has been published, instructors from other countries, cultures, and socioeconomic backgrounds might choose to remix your work for their course's needs. The changes they make might include:

- Translating the book into a different language
- Adjusting the content to meet the local cultural, regional, and geographical interests
- Revising the material for a different learning environment

Another option for making your work more inclusive from the beginning is to consider inviting instructors and professionals in your field to contribute to your OER; however, you should be aware of the ways in which your project's design may deter

or welcome people of other ethnicities, races, and cultural backgrounds.<sup>6</sup> For example, you may have set up regular meetings for those collaborating on your project at a time that is not feasible for a scholar living in a different time zone. Keep this and other considerations in mind if you would like people from other countries to collaborate on your project.

## Advancing Inclusivity through Open Pedagogy

As we covered in our section about teaching with OER, **open pedagogy** can be a powerful tool for letting students take control over how they engage with and relate to their course content. In some ways, engaging students in the creation of OER can be seen as the ultimate way of allowing them to see themselves reflected in their work.

However, there can be some concerns with this approach as well. For example, your student body might be composed of a majority of one race, sex, or class, making the total “picture” of the course content created by your students less inclusive

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6. Rebus Community. “Diversity, Equity, and Inclusion in OER.” YouTube video, 55:00. September 29, 2017. <https://youtu.be/rUiYiAT0uMQ>

overall.<sup>7</sup> Here are some considerations to keep in mind when having students create course content, especially if your course is covering a topic related to sex, race, or cultural studies:

- Ask students for their input on the inclusivity of your resources
- Think about how your OER could be more diverse (pictures, examples, etc.)
- Watch out for harmful depictions of diverse populations from your students. Have a plan in place to address issues if they arise

Fostering an environment of inclusion where your students can engage with different cultural norms is an important aspect of the college experience, whether you are teaching Physics or Criminal Justice. Although it might be daunting to jump into creating an inclusive educational resource, keep in mind that OER can be improved upon and continually revisited by yourself and others.

Start by finding or creating an OER that works for you and avoiding pitfalls like ethnocentric and trans-exclusionary language. You can always revisit your chosen OER or work

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7. Bali, Maha. “Critical Pedagogy: Intentions and Realities.” Hybrid Pedagogy. September 9, 2014. <http://hybridpedagogy.org/critical-pedagogy-intentions-realities/>

with others to improve upon it by adding more diverse examples later on.

## Don't "Other" Your Students

When attempting to make your course materials more inclusive for your students, the first thing you should watch out for is the possibility of “othering” your students. Merriam-Webster defines othering as “treating or considering (a person or a group of people) as alien to oneself or one’s group (as because of different racial, sexual, or cultural characteristics).”<sup>8</sup> Some best practices for avoiding othering include:

- Never assume your audience’s gender and/or gender identity, ability, or sexual orientation.
- Avoid calling the most commonly seen traits in your context “normal.”
- Make materials accessible for all students at all times.

## A Case Study – Showing Students Their Stories Matter by Justine Hope

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8. Merriam-Webster’s Dictionary. “Other.” Accessed May 12, 2019. <https://www.merriam-webster.com/dictionary/other>



## Blau<sup>9</sup>

Below, Instructor Justine Hope Blau explains how open education empowers students and offers inclusive perspectives.

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9. This case study comes from “Showing Students Their Stories Matter” by Justine Hope Blau, from CCCOER’s guest blog post,. Equity & Openness: Perspectives from North American colleges and universities. Retrieved on February 2, 2021 from <https://www.cccoer.org/2018/10/09/on-equity-diversity-inclusion-and-open-education/>.

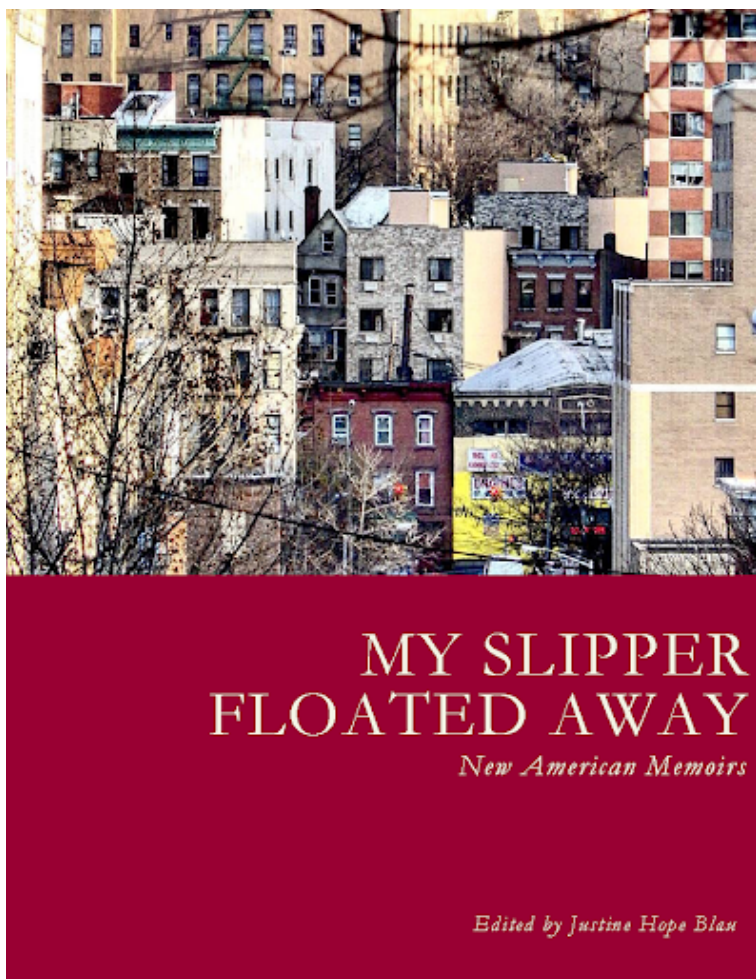


Image Credit: “My Slipper Floated Away: New American Memoirs” book cover

“This summer I published, on the CUNY Academic Commons, an anthology of essays written by my students at Lehman College in the Bronx. I teach memoir writing

workshops and most of my students are immigrants, first-generation American, and/or people of color. Here are some takeaways about the process:

My students write about growing up hearing gunshots and police sirens at night, using fire escapes as basketball hoops, and a ritual I'd never heard of: dancing at Thanksgiving. One student wrote about how he and his brother, at ages 11 and 14, had to fend for themselves after their father was deported.

The title of the anthology — *My Slipper Floated Away: New American Memoirs* — comes from Steven Ngin's gripping story of fleeing from the genocidal Khmer Rouge regime in Cambodia when he was four years old. He rode on his father's back as they crossed the Mekong River and watched his slipper float away; the metaphor also works for the other students' essays because they too are permeated by the theme of people moving forward after sustaining losses.

I'm a born-and-bred New Yorker and I thought I had a cosmopolitan understanding of the world – but I was amazed by my students' fresh perspectives. At a time when our nation is so polarized, I felt driven to collect these stories and get them distributed, both to people who are afraid of immigrants and POC, and also for those millions of immigrants and POC, who will be heartened to see how stories similar to their own are enriching American literature.

It took me over two years to publish the anthology. I edited the essays, wrote the introduction, got 25 students to sign author-agreement forms and searched for a cover illustration.

(Online I found an impressionistic photo of a Bronx cityscape and photographer Joe Raskin let me use it.) I also arranged for a librarian to explain copyright law to my students; they chose to allow open access for non-commercial use. Finally, I thought that all I had to do was upload a PDF to the CUNY Academic Commons — but it was not that simple. It took me over two years to publish the anthology. I edited the essays, “My Slipper Floated Away: New American Memoirs” book cover, wrote the introduction, got 25 students to sign author-agreement forms and searched for a cover illustration. (Online I found an impressionistic photo of a Bronx cityscape and photographer Joe Raskin let me use it.) I also arranged for a librarian to explain copyright law to my students; they chose to allow open access for non-commercial use. Finally, I thought that all I had to do was upload a PDF to the CUNY Academic Commons — but it was not that simple.

Several librarians, including Stacy Katz at Lehman, explained that a 168-page pdf is unwieldy and would take too long for readers to load on their laptops or cell phones. They spent a lot of time formatting the document and dividing it into sections so it would load quickly. At Stacy’s suggestion we used the Manifold platform to host the anthology.

The stories in *My Slipper Floated Away* are available for free, and licensed Creative Commons Attribution – Noncommercial – No-Derivatives License (CC-BY-NC-ND). We encourage librarians, professors of Ethnic studies, and

teachers of advanced ESL to use these stories as reading material. Please share liberally.”

Justine Hope Blau presented her work at the Sept 16, 2020, CCCOER webinar, “Decolonizing the Course.”

## 8.

# UNIVERSAL DESIGN

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## Introduction

A big part of the open education movement is the belief that education must be available to everyone, which means supporting the creation of free, open, and accessible educational resources. We are actively committed to making OER created at Iowa as usable and inviting as possible, and this chapter is intended to help you design your OER with **accessibility** in mind. It and others in this section, are adapted from *BC Open Textbook Accessibility Toolkit* by Amanda Coolidge, Sue Doner, and Tara Robertson<sup>1</sup>. I would invite you to review the full toolkit for more information about making your work accessible and inclusive.

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1. Adapted from BC Open Textbook Accessibility Toolkit. Authored by Amanda Coolidge, Sue Doner, and Tara Robertson. Provided by BCCampus. Located at <https://opentextbc.ca/accessibilitytoolkit/>. Licensed under CC BY: Attribution

# Universal Design

Universal Design is the process of creating products (devices, environments, systems, and processes) that are usable by people with the widest possible range of abilities, operating within the widest possible range of situations (environments, conditions, and circumstances). Universal Design emerged from the slightly earlier concept of being barrier-free, the broader accessibility movement, and adaptive technology and assistive technology. It also seeks to blend aesthetics into these core considerations.

Let's review two common definitions of Universal Design:

Definition 1: Universal Design or Universal Instructional Design (UID)

...an approach to teaching that consists of the proactive design and use of inclusive instructional and evaluation strategies. This approach provides academic access to a broad range of learners, including students with disabilities, while maintaining academic

standards [...] reducing the need to having to retrofit after a course is already underway<sup>2</sup>

Definition 2: Universal Instructional Design (UID)  
...an approach to designing course instruction, materials and content to benefit people of all learning styles without adaptation or retrofitting. UID provides equal access to learning, not simply equal access to information. UID allows the student to control the method of accessing information while the instructor monitors the learning process and initiates any beneficial methods... It should be noted that UID does not

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2. University of Victoria, “Universal Instructional Design (UID),” Centre for Accessible Learning, accessed March 27, 2018, <https://www.uvic.ca/services/cal/staff/universal-instructional-design/index.php>



remove academic challenges; it removes barriers to access.<sup>3</sup>

## Why Universal Design?

You may be surprised to learn that during the 2020-21 school year, 15% of all public school students received special education services, and a full  $\frac{1}{3}$  of those students had learning disabilities. These students benefit directly from accessible course materials since these materials work well with assistive technologies, like screen readers.

Yet as the University of Minnesota points out, accessible design can help many people who do not have disabilities. Captions on videos, for instance, can help English language learners better understand a video presentation, and a transcript of a podcast can help students who need to do their coursework in very noisy or very quiet places.

For our purposes, we frame the practice of using Universal

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3. Ohio State University, “Universal Design for Learning,” Partnership Grant: Fast Facts for Faculty, accessed March 27, 2018, [https://ada.osu.edu/resources/fastfacts/Universal\\_Design.htm](https://ada.osu.edu/resources/fastfacts/Universal_Design.htm).

Design in a holistic and manageable way and begin by addressing the barriers that are easy to anticipate and proactively remediate. This chapter, therefore, will provide guidance if the answer to any of the following questions is “yes.”

- Do I have visual materials that present core concepts that not all students may be able to see or understand?
- Do I have multimedia materials (e.g., audio, video) that present core concepts that not all students may be able to be hear, see, or otherwise access?
- Do I have documents that present core concepts in a format that not all students may be able to access?

## Using Personas as a Development Tool

Designers use personas to represent the different types of people who might access a website or product. Using personas can help you keep in mind the types of students and their various abilities while you’re developing content. These personas can also be used to introduce different types of hardware and software that students typically use.

Sarah Horton and Whitney Quesenbery have included a set of personas in their book *A Web for Everyone: Designing Accessible User Experience* that are specific to post-secondary students with print disabilities. These are some of the students

who will be reading the open textbooks that you write and interacting with the multimedia you create. Because the personas are under copyright, I have not included them here, but I would encourage you to visit the authors' book excerpt, posted on *UX Magazine's* website, which lists all the personas, their characteristics, and the assistive technologies they use. You can keep these personas in mind as you work to make your OER accessible.

## 9.

# ORGANIZING TEXT

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In this section, we provide recommendations to guide your inclusion of organized, hierarchical structure to aid accessibility.

## Organizing Content

Organizing content so it has a logical flow just makes sense.<sup>1</sup> Using chapters, headings, and sub-headings to organize a resource allows students to clearly see how the main concepts are related. In addition, headings are one of the main ways that students using a screen reader navigate through a chapter.

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1. Adapted from BC Open Textbook Accessibility Toolkit. Authored by Amanda Coolidge, Sue Doner, and Tara Robertson. Provided by BCCampus. Located at <https://opentextbc.ca/accessibilitytoolkit/>. Licensed under CC BY: Attribution

## Who are you doing this for?

Everyone benefits from having content that's clearly organized. Well-organized content supports students who are blind or have low vision, students who have learning disabilities, and even students who simply want a straightforward way to keep track of where they are and where they're going within a book or website.

## Why is this important?

Headings help to identify the hierarchical structure of a document (e.g., sections, sub-sections). They provide a visual cue that helps sighted readers quickly navigate through sections of a document, skimming until they find the section they are looking for. Similarly, headings create logical divisions in the content and allow a non-sighted user to navigate a page or document easily using a screen reader.

When it comes to using visual references to indicate the hierarchy and structure of a document, you might be accustomed to changing the font style, enlarging the type size, or highlighting the text with bold, underline or italics to create the impression of a heading. This approach presents problems when creating material with accessibility in mind because screen readers won't identify the text as a heading. Instead, the screen reader will just "read" through the text of a heading as

if it were regular content, missing your intended cues about structure and organization.

## What do you need to do?

In Pressbooks, WordPress, Microsoft Word, and most other text editors, use the visual editor to tag sections with Heading 1, sub-sections with Heading 2, sub-sections of sub-sections with Heading 3, and so on.

This very page of this Pressbook uses these headings to aid accessibility, in fact. The “Organizing Content” heading at the top of this page uses Heading 2, and the sub-sections, such as “Who are you doing this for?” use Heading 3 to indicate their relationship within the larger section.



Text headings in Pressbooks. *Heading options in Pressbooks' visual editor*

Amanda Coolidge, Sue Doner, and Tara Robertson. Provided by BCCampus. Located at <https://opentextbc.ca/accessibilitytoolkit/wp-content/uploads/sites/94/2018/06/heading-options-2.jpg>. Licensed under CC BY: Attribution

## 10.

# USING IMAGES

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## Using Accessible Images

In this section, we provide recommendations to guide your inclusion of accessible, image-based content.<sup>1</sup>

### What are images?

For the purposes of this discussion, we define images as non-text elements that include photographs, illustrations, diagrams, pictures, charts, graphs, and maps.

**File types used:** GIF, JPG, PNG

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1. Adapted from BC Open Textbook Accessibility Toolkit. Authored by Amanda Coolidge, Sue Doner, and Tara Robertson. Provided by BCCampus. Located at <https://opentextbc.ca/accessibilitytoolkit/>. Licensed under CC BY: Attribution



## Who are you doing this for?

This work supports students who:

- Are blind or have low vision
- Have poor contrast vision
- Are color blind and cannot differentiate between certain colors
- Use a device with monochrome display
- Use a print copy that is in black and white
- Have limited Internet access and cannot download images
- Have a form of cognitive disability

## What do you need to do?

Before you can determine what to do to make an image accessible, you must identify its *purpose* or *value* to your textbook. Consider the following questions:

- Does your image serve a functional purpose? In other words, is it conveying non-text content to students?
- Or does your image serve more of a decorative purpose? In other words, is it primarily a design element that does not convey content?

## Functional images

Consider what your content page would look like if the images didn't load. Now try writing alternative text for each image that would work as a replacement and provide the same information as the image.

There are three ways to provide alternative text descriptions for images:

1. Describe the image in the surrounding text.
2. Describe the image in the alt tag.
3. Create and link to a long description of the image.

As you work on developing your alternative text descriptions, keep the following recommendations and guidelines in mind:

- Remember that alternative text must convey the purpose and function of an image and is rarely a literal description of the image (e.g., “photo of cat”). Rather than providing what the image looks like, alternative text should convey the content of the image and what it does. This means that the same image may need different alt-text depending on how it's used.<sup>2</sup>
- For relatively simple images (e.g., photographs,

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2. Enter yo• “Alt text blunders,” WebAIM, accessed March 27, 2018,

illustrations), try to keep your text descriptions short, like a Tweet. You should aim to create a brief alternative (one or two short sentences) that is an accurate and concise equivalent to the information in the image.

- For more complex images (e.g., detailed charts, graphs, maps), you will need to provide more than a one- or two-sentence description to ensure all users will benefit from the content or context you intend to provide.
- Leave out unnecessary information. For example, you do not need to include information like “image of...” or “photo of...”; assistive technologies will automatically identify the material as an image, so including that detail in your alternative description is redundant.
- Avoid redundancy of content in your alternative description. Don’t repeat information that already appears in text adjacent to the image.

## Descriptions in surrounding text

You can use the surrounding text to provide the same information as conveyed by the image. This is often the best

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<http://webaim.org/articles/gonewild/#alttext>.ur footnote content here.

option for complex images because it makes the information available for everyone, not just those using the alt tags.

If you are editing someone else's work for accessibility, you are probably not at liberty to start adding to the main text. However, if you are the author, this is the best and easiest option.

If an image has been adequately described in the surrounding text, you can either provide a few-word description of the image in the alt tag or follow the procedures for decorative images.

### Example language in a textbook with an image described in the surrounding text:

Many older buildings in rural areas have infrastructure problems and are simply using workarounds until they can secure needed funds to adequately fix the problem. As you can see from the image below, this building in Virginia has visible cracks in the bricks and the wall is being reinforced with timber for added protection.



“Why Tucker’s Store Needs Repair” by David Hoffman ’41 is licensed under CC BY-NC-SA 2.0.

## Alt tags

An alt tag refers to the alt attribute (*alt* is short for alternative) within an IMG tag. All images uploaded into Pressbooks have an alt tag, but for them to be useful, you need to insert an image description.

Alt tags are used in two cases:

1. When an image doesn’t download due slow Internet, the alt tag content will display instead of the image.
2. For people who are visually impaired and use screen readers, when a screen reader finds an image, it will read out the content of the alt tag.

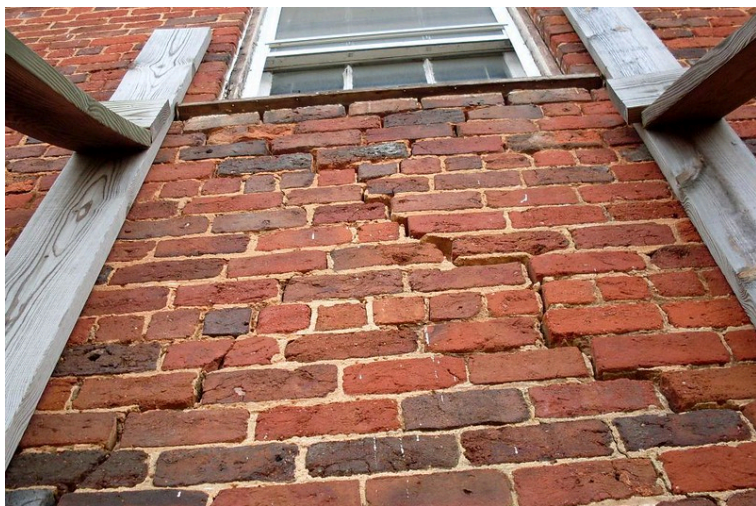
Alt tags should be no longer than 125 characters, including spaces and punctuation.<sup>3</sup>

Example language in a textbook with an image described in the alt-tag:

*NOTE: the alt-tags are only visible if you're using a screen reader or inspect the HTML. In the example below, the text above the photo does not describe the image but the alt-text does.*

Many older buildings in rural areas have infrastructure problems and are simply using workarounds until they can secure needed funds to adequately fix the problem.

- 
3. All screen readers are different, so a 125-character max is a recommendation. Other sources may provide a different number. This is because when a screen reader finds an image, it will say “Graphic” before reading out the alt tag. If the alt tag is longer than 125 characters, the screen reader will interrupt the flow of text and say “Graphic” again, before continuing to read out the alt tag. This can be confusing. For images that require descriptions longer than 125 characters, see the section on long descriptions.



“Why Tucker’s Store Needs Repair” by David Hoffman ’41 is licensed under CC BY-NC-SA 2.0.

## Long descriptions

Complex images, especially charts or graphs, will often require descriptions longer than 125 characters and it may not always be possible to add an explanation to the surrounding text. In this case, you can provide a link to a longer image description or an accessible table. One way to do this is to create a section for long descriptions in your resource and use links to allow people to easily switch between the image and its description and back again.

## Using color

Consider what your images would look like if they only

displayed in black and white. Would any necessary context or content be lost if the color was “turned off?” Images should not rely on color as the only means of conveying information. If your point requires color, you may need to edit or format the image so the concepts presented are not lost to those who are color blind or require high contrast between colors.

**Example 1: Inaccessible bar chart.** In Chart 1, color is the only means by which information is conveyed. For students who are color blind, have poor contrast vision, or are using a black-and-white print copy (see Chart 2), relevant information is lost.

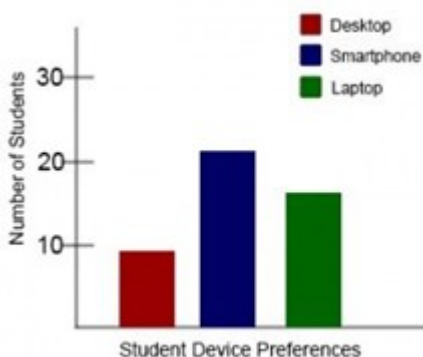


Chart 1:  
In this  
bar  
chart,  
color is  
the sole  
means  
of commu-  
nicating  
the  
data.



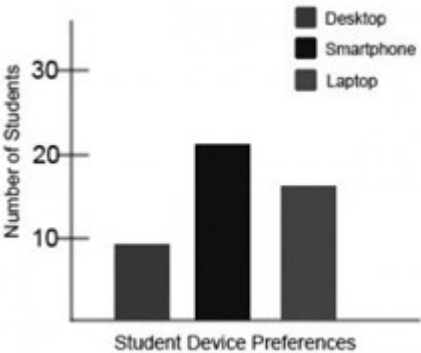


Chart 2:  
This view of the same bar chart displays how the chart might appear to a student who is color blind, or whose device does not display color. All of the meaningful data is lost.

**Example 2: Accessible bar chart.** Students who are color blind can distinguish between high-contrast shades. In Chart 3, contextual labels have been added to each bar at the bottom of the chart. Note that the chart will still require an alt tag.

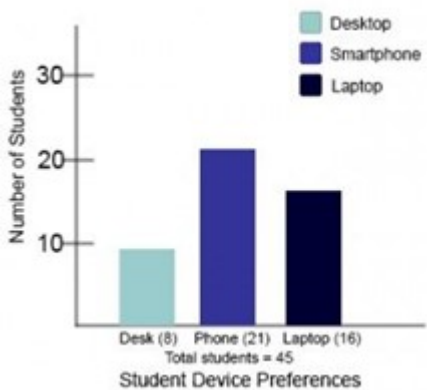


Chart 3: In this view of the bar chart, high-contrast colors have been used so that shading differences will still display in grey scale. Text labels have also been added so that the data is not just being communicated with color.

## Decorative images

If an image does not add meaning, i.e., if it's included for decorative or design purposes only, or if the image is adequately described in the caption and/or surrounding text, it doesn't need an alt tag. Including alternative text descriptions for decorative images "simply slows the process down with no benefit because the screen-reading software vocalizes the content of the [alternative text description], whether that alternative text adds value or not."<sup>4</sup>

However, this doesn't mean that you should leave an alt tag blank.

When a screen reader detects an image with a blank alt tag, it will read out the image file location. When an image doesn't require an alt tag, place two double-quotation marks ("" ) in the Alternative Text field; this step will prompt the screen reader to say "Graphic" and move on to the caption.

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4. "Top 10 Tips for Making Your Website Accessible," UC Berkeley: Web Access, accessed March 27, 2018, <https://webaccess.berkeley.edu/resources/tips/web-accessibility#accessible-alt>.

## 11.

# LINKS

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In this section, we review how to add accessible links to content.<sup>1</sup> Links include weblinks, links between different chapters of a book, links within a chapter, and links to attached files.

## What are links?

A link (also called a hyperlink) is found in a file, document, or web page that redirects the reader to additional information found in another online location such as a new web page; links are typically activated by clicking on a highlighted word or image on the screen.

**File types used:** HTML, PDF, DOCX, XLS

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1. Adapted from BC Open Textbook Accessibility Toolkit. Authored by Amanda Coolidge, Sue Doner, and Tara Robertson. Provided by BCCampus. Located at <https://opentextbc.ca/accessibilitytoolkit/>. Licensed under CC BY: Attribution

## Why are you including the links you have selected?

Generally, links are included within content to point the user to additional information that is available at another location. Links between different parts of a book are also used to facilitate navigation.

## Who are you doing this for?

This work supports students who:

- Have a physical disability
- Have a form of cognitive disability
- Are deaf or hard of hearing
- Are blind or have low vision

## What do you need to do?

Links can be helpful. But, like other non-text elements, they must be assessed for how students with a range of challenges can and will access them. Understanding and attending to these needs through descriptive text, proper link opening, and—when needed—a web address will ensure that all students can benefit.

## Create descriptive link text

You need to ensure that all links have text that describes the topic or purpose of the link. This is important because people using screen readers might have their screen reader set to read out the text for each link on a page. As such, the link text must describe the content of the link when taken out of context for the surrounding paragraph. While link texts such as “click here” or “read more” will make sense to sighted users, they mean nothing when read on their own.<sup>2</sup>

**Example 1:** Click here for information on BCcampus Open Education.

**Example 2:** You can find more information on BCcampus Open Education at <http://open.bccampus.ca/>.

**Example 3:** Information on BCcampus Open Education is available online.

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2. “Ensure link text is meaningful within context,” Web Accessibility, accessed March 28, 2018, [https://www.webaccessibility.com/best\\_practices.php?best\\_practice\\_id=1301](https://www.webaccessibility.com/best_practices.php?best_practice_id=1301).

While the first two examples make sense in the context of the sentence, neither link text describes the purpose of its link. While the second example is better than the first, having the web address as the link text still does not make the purpose of the link clear. The third example is the most accessible since the link still make sense even if it were taken out of the surrounding sentence.

## Link to non-web content

If you want to link to something that isn't a web page—such as a Word document, Excel file, or PDF—you should include this information in the link text. This is important because it informs the user what will happen when they click on the link, thus preventing confusion. In addition, a user may decide not to click on a link if they know it's a certain file type. This typically happens when a user doesn't have the software needed to open the file or when they know the file type is inaccessible to them.

**Example:** B.C. Open Textbooks Review Rubric  
[Word file]



## New tabs/windows

The default setting for links in most text editors is that they not open in a new window or tab. This is the preferred behavior, since a new window, opening unexpectedly, can be disorienting for people. This is especially true for individuals who have difficulty perceiving visual content.

However, if a link must open in a new window or tab, the best practice is to include a textual reference.<sup>3</sup>

**Example:** Information on BCcampus Open Education [New Tab] is available online.

## Links in reference lists

Citation styles often require a URL to be provided for all web-based content. For example, in APA style, the *Accessibility Toolkit* would be referenced as follows:

Coolidge, A., Doner, S., Robertson, T., & Gray, J.

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3. Penn State, “Links on a Web Page,” Accessibility, accessed March 28, 2018, <http://accessibility.psu.edu/linkshhtml>.

(2018). *Accessibility Toolkit* (2nd ed.). BCcampus. <https://opentextbc.ca/accessibilitytoolkit/>

The URL is provided to make it easy for people to navigate to the original source. However, it can be frustrating when screen readers read out the full URL for every source. As such, how can we make this link accessible to people using screen readers while still adhering to citation guidelines?

## Option 1: WAI-ARIA labels

One solution is WAI-ARIA.<sup>4</sup> WAI-ARIA allows you to add attributes to HTML to provide instructions that are recognized by assistive technologies. As such, we can hyperlink the URL and use an ARIA label to specify what the screen reader should read aloud. This way, the URL will still appear visually and can be clicked to navigate to the source, but when a screen reader encounters it, it will read out the ARIA label rather than the URL.

Here is what the citation would look like: Coolidge, A., Doner, S., Robertson, T., & Gray, J. (2018). *Accessibility Toolkit* (2nd ed.). BCcampus. <https://opentextbc.ca/accessibilitytoolkit/>

Here is what the HTML would look like: <p

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4. Thank you to Baldur Bjarnason for sharing this workaround on the Rebus Community help page.

class="hanging-indent">Coolidge, A., Doner, S., Robertson, T., & Gray, J. (2018). *Accessibility Toolkit* (2nd ed.). BCcampus.

## Option 2: Link in the citation title

If editing HTML is out of your comfort zone, another option is to use the title in the citation as the link text and leave the URL unlinked.

Here is an example:

Coolidge, A., Doner, S., Robertson, T., & Gray, J. (2018). *Accessibility Toolkit* (2nd ed.). BCcampus. <https://opentextbc.ca/accessibilitytoolkit/>

With this method, screen readers would still read out the URL if references were being read through from beginning to end. However, if a person using a screen reader wanted to navigate through the page by links, they would hear the title rather than the URL.

## 12.

# TABLES

---

In this section, we provide guidelines and recommendations for formatting tables.<sup>1</sup>

## What are tables?

In this context, tables refer to *data tables*, which include row and/or column header information to categorize content. (Tables that do not have headers are called *layout tables*.)

**File types include:** DOCX, HTML, PDF

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1. Adapted from BC Open Textbook Accessibility Toolkit. Authored by Amanda Coolidge, Sue Doner, and Tara Robertson. Provided by BCCampus. Located at <https://opentextbc.ca/accessibilitytoolkit/>. Licensed under CC BY: Attribution

## Are your tables simple or complex?

A simple table includes a maximum of one header column and/or one header row. A complex table includes more than one header column and/or header row and may include merged or split cells.<sup>2</sup>

We recommend you make every effort to keep data tables as simple in structure as possible. The more complex the design of a data table, the less accessible it will be for some students using screen-reading technology to access their textbook materials. Screen readers move left-to-right, top-to-bottom, one cell at a time, and because a screen reader does not repeat a cell, merging or splitting cells can affect the reading order of a table.

However, you can use merged or split table cells if they are formatted correctly. Check out this web page to learn more: Tables Concepts

## Who are you doing this for?

This work supports students who:

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2. Penn State, "Tables," Accessibility, accessed March 28, 2018, <http://accessibility.psu.edu/tables>.

- Have a form of cognitive disability
- Are blind or have low vision

## What do you need to do?

In the same way that your content hierarchy needs headings and structure, tables need a properly defined structure to be accessible. This means that you must add row and column headers to define the different sections of data. Screen readers read tables horizontally—cell by cell, row by row—and row and column headers help give context to the data in each cell for students who are blind, have low vision, or have a cognitive disability.

## Create simple tables

A simple table includes:

1. A table title or caption
2. Maximum of one row of column headers and/or maximum of one column of row headers, with the appropriate scope assigned
3. Avoid using merged or split cells
4. Adequate cell padding for visual learners

**Example 1: How to create a simple table.** The table below is a simple table. Reviewed against the preceding requirements list, this table:

- 1. Includes a **caption** (Spring Blossoms)
- 2. Has one row in which cells are tagged as **column headers** (Color Family, Bulbs, Shrubs, Trees), and one column (beginning on the second row) in which the cells are tagged as **row headers** (Pink, Yellow)
- 3. Avoids the use of merged or split cells wherever possible
- 4. Has adequate **cell padding** to provide space buffering around the data in each cell. (Cell padding in this table is set at “10”).

**Spring Blossoms**

Color Family	Bulbs	Shrubs	Trees
Pink	Tulips	Flowering currant	Ornamental plum
Yellow	Daffodils	Forsythia	Star magnolia

For a student accessing the table through a

screen reader, the first row of data following the column headers will be presented along the lines of:

- Row 2, Color family, column 1, Pink
- Bulbs, column 2, Tulips
- Shrubs, column 3, Flowering currant
- Trees, column 4, Ornamental plum

Marking cells in the first row and/or column of a table as header cells allows a screen reader to interpret the structure of a table and how cells relate to each other. This, in turn, ensures that someone using a screen reader can navigate through a table and understand what column/row a given cell is in. If a table doesn't have headers, the screen reader will recite cell information starting in the upper left corner and continuing left to right, top to bottom. Most text editors used to create OER will have the option to mark headers.



13.

# MULTIMEDIA

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In this section, we provide recommendations to guide your inclusion of accessible multimedia content.<sup>1</sup>

## What are multimedia?

In general multimedia refers to things such as videos, audio, animations, and slideshows.

**File types used:** MP3, MP4, PPT

## What types of multimedia are you including?

Before you can determine what you need to do to make media

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accessible, you must understand what is required for different types of multimedia. Consider the following questions:

Does your multimedia resource include audio narration or instructions? If so, you should:

- provide a complete transcript of all speech content and relevant non-speech content in the resource

Does your multimedia resource include audio that is synchronized with a video presentation? If so, you should:

- provide captions of all speech content and relevant non-speech content in the resource

Does your multimedia resource include contextual visuals (e.g., charts, graphs) that are not addressed in the spoken content? If so, you should:

- provide audio descriptions of relevant visual materials in the resource

## Who are you doing this for?

This work supports students who:

- Are deaf or hard of hearing
- Are blind or have low vision

- Have a form of cognitive disability
- Are in a location where they cannot play or hear audio
- Are not native-English speakers and need written-word formats to support understanding

## What do you need to do?

Many types of multimedia present information in a non-text manner. For students unable to use the original version of these formats, providing text as a transcript, caption, or written description gives them access.

### Transcripts

Consider what your students would get out of your multimedia resource if they were not able to hear the audio portion, or if they had difficulty understanding the spoken word. A text transcript provides students with equivalent information to the audio content in a multimedia resource.<sup>2</sup>

As you work on developing a text transcript, keep in mind the following recommendations about what to include:

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2. “Web Content Accessibility Guidelines (WCAG) 2.0: Guideline 1.2,” W3C, <http://www.w3.org/TR/WCAG20/#media-equiv> (accessed April 17, 2018).

- Speaker's name
- All speech content. If there is speech that is not relevant, it is usually best to indicate that it has been excluded from the transcript, e.g., "[A & B chatted while slides were loading]."
- Relevant descriptions about the speech. Descriptions that convey emotions and mood are usually provided in brackets, e.g., "Don't touch that! [shouted]."
- Descriptions of relevant non-speech audio. These are usually provided in brackets, e.g., "[metal pipes crashing to concrete floor]." Background noise that isn't relevant can be left out.
- Headings and sub-headings. Headings help when they make a transcript more usable or easy to navigate, especially when the transcript is long. When included, put headings in brackets to show they were not part of the original audio, e.g., [Introduction]; [Group Discussion]; [Case Study].

**Transcripts and Third-Party Videos.** If you are not producing your own video resource but are planning to embed video materials from a third-party source (e.g., YouTube), be aware that

not all third-party videos include transcripts. While services like YouTube technically support transcripts, not all of their contributors include them. If you select a video resource that does not already have a transcript, you will need to produce one yourself.

Creating a transcript for a third-party video might infringe on copyright, depending on how the video has been licensed. Before producing a transcript for media materials you did not create, contact the copyright holder of that material for permission to do so. (See information about using YouTube in Pressbooks in the *Pressbooks Guide*.)

## Captions

Captions are the text that is synchronized with the audio in a video presentation. Captions are important when people need to see what's happening in the video and get the audio information in text at the same time.

The work you put into creating a text transcript for a video resource can be repurposed to provide captions. Keep in mind

the following recommendations about what to include in your captions:

- All speech content. If there is speech that is not relevant, it is usually best to indicate that it has been excluded from the captions, e.g., “[A & B chatted while slides were loading].”
- Descriptions of relevant non-speech audio. These are usually provided in brackets, e.g., “[metal pipes crashing to concrete floor]”; “[background music by XXX plays].” Background noise that isn’t relevant can be left out.

## Audio Descriptions

Consider what your students would get out of a multimedia resource if they were not able to see embedded visual materials critical for comprehension. Audio descriptions are helpful if visual content (e.g., a chart or map) in a video or presentation provides important context that is not available through the audio alone.<sup>3</sup>

When describing visual elements in your multimedia

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3. “Web Content Accessibility Guidelines (WCAG) 2.0: Guideline 1.2.3,” W3C, accessed April 17, 2018, <http://www.w3.org/TR/WCAG20/#media-equiv>.

resources, keep in mind the following recommendations and guidelines:

- When contextual visual content on the screen is not described in the audio itself, you will need to provide an objective audio description of the visual element.
- Whenever possible, avoid creating the need for audio descriptions in the first place by being proactive at the time of recording. If you pay attention to contextual visuals while recording, you may find opportunities to convey the visual content with the accompanying spoken material instead of inserting audio descriptions of the visual content after the fact.

**Example 1:** To help students fully grasp a concept that you are trying to convey in your video, you have included some contextual visual references (e.g., maps, charts, physical demonstrations of a process). However, you realize, after making the video, that the audio portion does not describe these visuals in enough detail for a student, like Jacob, to be able to access all of the concepts you intended to convey.

In this case, you would need to record an audio description of the visual material that provides enough detail so students, like Jacob, have the same content available to visual learners.

**Example 2:** You are recording a video or presentation that includes a chart that tracks coal production in British Columbia, and as part of the presentation you want to focus on specific data in the chart. The narrator or presenter might point to sections on the chart and say:

*“As you can see, metallurgical coal projection increased by three million tonnes over these two years.”*

In this case, audio descriptions would be necessary to provide the missing context to students with visual disabilities; these students cannot see the data on the chart that tells visual learners what the production figures are and for



what dates. However, if the narrator or presenter instead says:

*“This chart illustrates that metallurgical coal production in B.C. increased from 23 million tonnes in 1999 to 26 million tonnes in 2001,”*

the visual content is conveyed through the audio and no audio description will be necessary.

## 14.

# FORMULAS

---

In this section, we review how to add accessible formulas to content.<sup>1</sup>

## What are formulas?

Formulas refer to math equations and science formulas.

**File types used:** LaTeX, MathType

## Who are you doing this for?

This work supports students who:

- Are blind or have low vision

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- Have a form of cognitive disability
- Have a physical disability

## What do you need to do?

There are several ways to handle equations, from images with alt tags to MathML. Having access to an equation editor such as MathType or MathMagic can streamline processing and converting equations. These tools are similar to equation editors found in Microsoft Office.

## MathML

Math ML is a text-based XML (short for “extensible markup language”) designed for math equations. Browsers that support MathML are able to translate the XML into a formatted equation. Since MathML with MathJax can be rendered in many systems, including HTML, Angel, and Drupal, it is considered the best choice for accessibility.

Here is information about creating and viewing MathML.

MathML may vary from system to system and the content can change rapidly.

## Image with an alt tag

A safe option is to create an image of an equation (or export

it from an equation editor) and then insert the image into a document with an alt tag.

Note: Alt tags can be written in Nemeth MathSpeak for students who have learned that system.

**Example 1:** An equation in HTML.

$$m = \frac{m_0}{\sqrt{1 - \frac{v^2}{c^2}}}$$

View the alt tag

alt = "m equals begin fraction m sub 0 over begin square root 1 minus begin fraction v sup 2 over c sup 2 end fraction end square root end fraction"

## LaTeX

LaTeX is a math markup language familiar to many in the science and math community. Unfortunately, it is not

currently supported by screen reader technology. It is, however, fairly simple to convert LaTeX to an image or MathML in most equation editors.

To import LaTeX, follow these steps in MathMagic and MathType:

1. Copy a piece of LaTeX code such as

$m \&=$

```
\frac{m_0}{\sqrt{1-\frac{v^2}{c^2}}}
```

into an equation editor's main editing window.

2. The equation should appear fully formatted. Make minor adjustments as needed.

## Additional resources

### Math accessibility at Portland Community College

In 2012, Portland Community College departments took a closer look at making math accessible to blind students. Read more about the math accessibility study.

Watch Math Accessibility at Portland Community College. (This video is an open educational resource.)

## Text attributions

This chapter is a derivative of Equations: MathML, Images and LaTeX by Penn State. Penn State has provided permission to the authors to use this information under the license of the toolkit.

15.

# CHECKLIST FOR ACCESSIBILITY

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This checklist can help provide an at-a-glance look at the accessibility of your OER.<sup>1</sup> The other chapters of this section provide a deeper dive into accessibility in the categories below. Click the header to jump to the section of this Pressbook where these concepts are discussed in more depth.

## Organizing Content

- ☐ Content is organized under headings and subheadings.
- ☐ Headings and subheadings are used sequentially (e.g., Heading 1, Heading 2).

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## Images

☐ Images that convey information include alternative text (alt text) descriptions of the image's content or function.

☐ Graphs, charts, and maps also include contextual or supporting details in the text surrounding the image.

☐ Images do not rely on color to convey information.

☐ Images that are purely decorative do not have alt-tag descriptions. (Descriptive text is unnecessary if the image doesn't convey contextual content information).

## Links

☐ The link is meaningful in context and does not use generic text such as "click here" or "read more."

☐ Links do not open in new windows or tabs.

☐ If a link must open in a new window or tab, a textual reference is included in the link information (e.g., [NewTab]).

## Tables

☐ Tables include row and column headers.

☐ Row and column headers have the correct scope assigned.

☐ Tables include a caption.

☐ Tables avoid merged or split cells.



- ☐ Tables have adequate cell padding.

## Multimedia

- ☐ A transcript is available for each multimedia resource including relevant non-speech content.

- Transcript includes:
  - speaker's name
  - all speech content
  - relevant descriptions of speech
  - descriptions of relevant non-speech audio
  - headings and subheadings
  - Captions of all speech content and relevant non-speech content are included in the multimedia resource; this includes the audio synchronized with a video presentation.
  - Audio descriptions of contextual visuals (e.g., graphs, charts) are included in the multimedia resource.

## Formulas

- ☐ Formulas have been created using MathML.
- ☐ Formulas are images with alternative text descriptions if MathML is not an option.

## Font size

- ☐ Font size is 12 point or higher for body text.
- ☐ Font size is 9 point for footnotes or endnotes.
- ☐ Font size can be zoomed to 200%.

PART IV

# TEACHING AND ADVOCATING FOR OPEN



16.

# OPEN PEDAGOGY AND PRACTICES

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Openness in education brings potential for co-creation and learning through active participation in how knowledge is produced.<sup>1</sup>

## Learning Outcomes

- Explain how copyright restricts pedagogy

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1. This chapter is adapted from The Creative Commons' CC Certificate Resources, Chapter 5: Creative Commons For Educators, published under a Creative Commons Attribution 4.0 International License.

- Learn the differences between open pedagogy, open practices, and OER-enabled pedagogy and describe how open licensing enables each
- List examples of open pedagogy in practice

## Why It Matters

Do you remember when smartphones were first released? They were full of infinite possibilities compared to earlier phones. Before smartphones, we could only call and text. After smartphones, we now take videos and pictures, play movies and music, surf the web and read email, and call and text. Some long-time users of older phones had difficulty taking advantage of all the capabilities offered by new phones. They were too accustomed to the limitations of older phones. In some cases, these users only called and texted on their smartphones. (Maybe you know someone like this!)

Many educators have a similar problem with OER. They've used education materials published under restrictive licenses for so long that they struggle to take advantage of the new pedagogical capabilities offered by OER. Open pedagogy, open practices, and OER-enabled pedagogy are all about the teaching and learning practice and tools that empower teachers

and learners to create and share knowledge openly and learn deeply.

## Three Definitions

The open education movement is still discussing and debating what it means to think about teaching and learning practices in a more inclusive, diverse, and open manner. At least three major definitions have emerged from this discussion.

Term and Source	Definition
<b>Open Education Practices</b> (from Cronin and MacLaren’s 2018 Open Edu Global presentation)	Use, reuse, and creation of OER and collaborative, pedagogical practices employing social and participatory technologies for interaction, peer-learning, knowledge creation and sharing, and empowerment of learners
<b>Open Pedagogy</b> (from DeRosa & Jhangiani’s chapter in the 2017 Guide to Making Open Textbooks with Students):	An access-oriented commitment to learner-driven education and a process of designing architectures and using tools for learning that enable learners to shape the public knowledge commons of which they are a part  More at <a href="http://openpedagogy.org/open-pedagogy">http://openpedagogy.org/open-pedagogy</a>
<b>OER-enabled Pedagogy:</b> (from Wiley, 2017 blog post)	The set of teaching and learning practices only possible or practical when you have permission to engage in the 5R activities.

Personal Reflection: Why it Matters to You

If you’ve used OER in the past, have you taken



advantage of the permissions offered by their open licenses, or did you use OER just like you used your previous, traditionally copyrighted materials? In other words, did you do anything with the OER that was impossible to do with traditionally copyrighted materials? Why or why not?

## Acquiring Essential Knowledge

It's well established that people learn through activity. It's equally well established that **copyright** restricts people from engaging in a range of activities. When juxtaposed like this, it becomes clear that copyright restricts pedagogy by contracting the universe of things learners and teachers can do with education materials. If there are things learners aren't allowed to do, there are ways learners aren't allowed to learn. If there are things teachers aren't allowed to do, there are ways teachers aren't allowed to teach.

You can learn about how this restriction on what teachers and learners can do impacts teaching and learning by reading this blog post about driving airplanes on roads.



Fly away in a Robinson r22 beta by Archangel12 / CC BY 2.0

OER-enabled pedagogy is the set of teaching and learning practices that are only possible or practical in the context of the 5R permissions that come with OER. OER-enabled pedagogy describes all the new ways that Creative Commons licenses allow learners to learn and all the new ways they allow teachers to teach.

## Disposable and Renewable Assignments

Do you remember doing homework for school that felt utterly pointless? A “disposable assignment” is an assignment that supports an individual student’s learning but adds no other value to the world. The student spends hours working on it,

the teacher spends time grading it, and the student gets it back and then recycles it. While disposable assignments may promote learning by an individual student, these assignments can be demoralizing for people who want to feel like their work matters beyond the immediate moment.

OER-enabled pedagogy can be used to create “renewable assignments” — assignments that both support individual student learning and add value to the broader world. With renewable assignments, learners are asked to create and openly license valuable artifacts that, in addition to supporting their own learning, will be useful to other learners both inside and outside the classroom. For example, classic renewable assignments include collaborating with learners to write new case studies for textbooks, create “explainer” videos, and modify learning materials to speak more directly to learners’ local cultures and needs.

Explore examples of OER-enabled pedagogy in action, including David Wiley and Robin DeRosa’s examples of learners adapting existing materials to create new textbooks. In both of these cases, teachers had learners create their own textbooks, which then had Creative Commons licenses applied to them. Other examples of OER-enabled pedagogy in action include Murray and Azzam’s assignments that had learners significantly improve articles on Wikipedia. When they completed these assignments, learners created open artifacts useful to both in supporting their own learning and the learning of other learners and educators. These examples

of OER-enabled pedagogy have learners creating assignments that allow them to interact with the greater community and ensure that the assignments are renewable, not disposable artifacts.

A couple of other interesting examples of renewable assignments are a remixed explainer video that a student made about blogs vs. wikis, and the DS106 assignment bank, which is a hub for student created, CC-licensed content. Additional examples of open pedagogy are available on the Open Pedagogy website.

## Final remarks

If you use your smartphone the same way you used a flip phone, getting a new phone served little point. Likewise, when we use OER to support learning in exactly the same ways we used old all rights reserved materials, we may save learners money but miss out on the transformative power of open. As you prepare to use OER in your teaching, think about new things that are possible in the context of permission to engage in the 5R activities.

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# OPENING UP YOUR INSTITUTION

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How education institutions can support open education content, practices, and community with policy.<sup>1</sup>

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1. This chapter is adapted from The Creative Commons' CC Certificate Resources, Chapter 5: Creative Commons For Educators, published under a Creative Commons Attribution 4.0 International License.



Photo by Stories of change, CC BY 2.0

## Why It Matters

Educational institutions around the world are trying to figure out how to support their educators, staff, and learners in using, revising, and sharing OER, with new open education practices, and the communities that sustain them. How can education leaders use various policy tools to support and promote open education?

## Learning Outcomes

- Consider if and why you need a policy to accomplish your open education goals
- Understand the menu of open education policy options
- Assess your existing institutional policies
- Understand how to develop an institutional open policy

## Personal Reflection: Why it Matters to You

What if there were institutional policies that supported your open education work? What if money and time were available to educators who wanted to redesign their courses to make them open? What if promotion and tenure guidelines

rewarded sharing your educational resources and/or research? What effect might pro-open education policies have on you and your learners?

## Acquiring Essential Knowledge

Educational institutions have a broad menu of open education policy options from which to choose.

Raise awareness of the existence of OER and the benefits for your learners and faculty.

Action: Host an annual “open education” day at your school or university.

Empower stakeholders to drive your institution's open education strategy.

Action: Create an Open Education Task Force comprised of learners, faculty, accessibility experts, deans, bookstore, financial aid, library, instructional designers, eLearning, etc.



## Ensure all of the content you fund is OER.

Action: Draft, adopt, and implement an open licensing policy requiring university / school funded resources to be openly licensed. Use the OER Policy Development Tool to build an open policy for your institution. You can find examples of open policies others have created at the OER Policy Registry (global) and North American OER policies and projects

## Issue a call-to-action to solve an education challenge.

Action: Create an OER Grant Program. Appropriate funds for supporting faculty and staff to shift your 50 highest enrolled courses from closed content to OER.

Example: The Maricopa County Community College started an open textbook initiative to lower costs of teaching materials. They provided grants to create open courses and train faculty on OER. Learn more about their process at their website, Maricopa Millions OER Project.

## Leverage existing strategic documents to support open education.

Action: Add open education goals to key institutional strategy documents.

Action: Identify and track key performance indicators that improve when courses / degrees adopt OER.

Example: Increasing student outcomes, increasing the percentage of learners who can access 100% of the learning resources on day 1, reducing dropouts during add/drop periods, increasing credits taken per semester, decreasing student debt, decreasing time to degree.

## Make it easy to share OER.

Action: Join a global OER repository and make it simple for your educators and learners to find others' OER and share their OER. Provide professional development.

## Ensure educators have the legal rights to share.

Action: Change the contract between the institution and the faculty / teachers so the educator has the legal rights to CC license their work.

Example: A Creative Commons policy in New Zealand gives teachers advance permission to disseminate their resources online for sharing and reuse. The policy also ensures that both the school and the teacher — as well as teachers from around the country and around the world — can continue to use and adapt resources produced by New Zealand teachers in

the course of their employment. Creative Commons NZ have developed an annotated policy template for schools to adapt.

## Provide OER information to learners.

Action: Require OER Course designations in course catalogs so learners can see whether (or not) a course uses OER or an open textbook. Example: CUNY labels OER in their catalog (video).

## Reward sharing

Action: Adjust promotion and tenure policies to reward the creation / adoption / maintenance of OER and publishing in Open Access journals. The creation and adaptation of OER should be appropriately recognized as curricular innovation and service to the academic profession during promotion and tenure review.

# Enforcing Open Education Policies

The point of most open education policies is to ensure the publicly (or foundation) funded educational resources are available to the public with 5Rs permissions. When it comes

to enforcing open education policies, many people play important roles.

The funder and its program officers need to understand the open policy, communicate the importance of it to grantees verbally and in writing, and follow-up by checking to ensure the public has full access to the openly licensed content under the terms of the policy.

The university or college administration should provide support (e.g., hire a full-time OER or OA librarian) to faculty creating, remixing, sharing, and adopting OER as well as those redesigning their courses toward open pedagogy and practices. Institutions can also review and modify (as needed) promotion and tenure policies to ensure faculty engaged in open education work are rewarded (not punished) during promotion and tenure review.

## Final Remarks

When education institutions support their educators, staff, and learners in moving from closed to open content and practices, open education thrives. Educators want to design the best courses, adjust their practices and pedagogy to empower learners to co-create knowledge, and push the limits of knowledge by openly sharing their ideas and resources with a global audience. But educators can't do it alone. They need political, financial, time, staff, and policy support to shift to, and fully realize, the benefits of open education.

# GLOSSARY

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## 5Rs

The permissions that are "baked in" to OER: Revise, remix, reuse, retain, and redistribute. The 5Rs distinguish OER from other learning materials that are copyrighted under traditional, all-rights-reserved copyright.

## Accessibility

When all people can perceive, understand, navigate, and interact with electronic information and be active, contributing members of the digital world. Visual, auditory, physical, speech, cognitive, and neurological disabilities should be taken into account when implementing accessibility measures.

Source: <https://www.nationaldb.org/for-state-deaf-blind-projects/accessibility-toolkit/why-accessibility-is-important/>

## Attribution–NoDerivatives: CC BY–ND

See CC BY–ND

Attribution–Noncommercial–NoDerivatives: CC  
BY–NC–ND

See CC BY–NC–ND

Attribution–Noncommercial–Sharealike: CC BY–NC–SA

See CC BY–NC–SA

Attribution–Noncommercial: CC BY–NC

See CC BY–NC

Attribution–Sharealike: CC BY–SA

See CC BY–SA

Attribution: CC BY

See CC BY

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Creative Commons By license. Allows reusers to distribute, remix, adapt, and build upon the material in any medium or format, so long as attribution is given to the creator. The license allows for commercial use.

Source: <https://creativecommons.org/about/cclicenses/>

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Source: <https://creativecommons.org/about/cclicenses/>

## CCO

Creative Commons Zero license. A public dedication tool, which allows creators to give up their copyright and



put their works into the worldwide public domain. CC0 allows reusers to distribute, remix, adapt, and build upon the material in any medium or format, with no conditions.

## Copyright

A form of protection provided by the laws of the United States to the authors of “original works of authorship” that are fixed in a tangible form of expression. An original work of authorship is a work that is independently created by a human author and possesses at least some minimal degree of creativity. A work is “fixed” when it is captured (either by or under the authority of an author) in a sufficiently permanent medium such that the work can be perceived, reproduced, or communicated for more than a short time.

Source: <https://www.copyright.gov/circs/circ01.pdf>

## Creative Commons (CC) licenses

Licenses that work with traditional copyright to enable use and reuse of others' works by communicating in a standardized way the rights a creator wants to share with others. CC Licenses are: CC BY, CC BY-SA, CC BY-NC, CC BY-NC-SA, CC BY-ND, CC BY-NC-ND.

Source: <https://creativecommons.org/about/cclicenses/>

## Equity

The act of developing, strengthening, and supporting procedural and outcome fairness in systems, procedures, and resource distribution mechanisms to create equitable (not equal) opportunity for all people.

Source: <https://ofm.wa.gov/sites/default/files/public/shr/Diversity/SubCommit/DEIGlossaryofEquityRelatedTerms.pdf>

## Five Rs

See 5Rs

## Inclusion

Intentionally designed, active, and ongoing engagement with people that ensures opportunities and pathways for participation in all aspects of group, organization, or community. Inclusion refers to how groups show that people are valued as respected members of the group, team, organization, or community.

Source: <https://ofm.wa.gov/sites/default/files/public/shr/Diversity/SubCommit/DEIGlossaryofEquityRelatedTerms.pdf>

## OER

Open Educational Resources. These are teaching,

learning, and research materials that reside in the public domain or have been released under an open license that permits their free use and re-purposing by others.

Source: <https://creativecommons.org/about/program-areas/education-oer/>

## Open pedagogy

A form of experiential learning in which students demonstrate understanding through the act of creation; the practice of engaging with students as creators of information rather than simply consumers of it.

## Public domain

Works not protected by copyright; they belong to the public and can be used in any way without permission from the creator(s).

## Redistribute

One of the Five Rs of OER. The right to share copies of the original content, your revisions, or your remixes with others (e.g., give a copy of the content to a friend)

## Remix

One of the Five Rs of OER. The right to combine the original or revised content with other material to create

something new (e.g., incorporate the content into a mashup)

## Renewable assignments

An assignment designed for students to learn and to contribute to the field of study at the same time, adding value to the world and providing a foundation for future students to learn and build upon. To be considered renewable, the teacher invites the students to openly license and publicly share their work with the global community.

Source: <https://flexible.learning.ubc.ca/news-events/renewable-assignments-student-work-adding-value-to-the-world/>

## Retain

One of the Five Rs of OER. The right to make, own, and control copies of the content (e.g., download, duplicate, store, and manage)

## Reuse

One of the Five Rs of OER. The right to use the content in a wide range of ways (e.g., in a class, in a study group, on a website, in a video)

## Revise

One of the Five Rs of OER. The right to adapt, adjust, modify, or alter the content itself (e.g., translate the content into another language)

## Universal design

The process of creating products (devices, environments, systems, and processes) that are usable by people with the widest possible range of abilities, operating within the widest possible range of situations (environments, conditions, and circumstances). Universal Design seeks to create barrier-free resources, working with the broader accessibility movements, and adaptive and assistive technologies.

# REPOSITORY LIST

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Repository	URL	Type
ccMixer – Community Music Remixing Site	<a href="http://www.ccmixer.org/">http://www.ccmixer.org/</a>	Audio
Public Domain and Royalty Free Music	<a href="https://www.pdinfo.com/">https://www.pdinfo.com/</a>	Audio
Internet Archive – Music	<a href="https://archive.org/details/audio">https://archive.org/details/audio</a>	Audio
Free Music Archives	<a href="http://freemusicarchive.org/">http://freemusicarchive.org/</a>	Audio
University of Oxford Podcasts	<a href="https://podcasts.ox.ac.uk/index.php/">https://podcasts.ox.ac.uk/index.php/</a>	Audio
BandCamp	<a href="https://bandcamp.com/tag/creative-commons">https://bandcamp.com/tag/creative-commons</a>	Audio
Freesound	<a href="http://www.freesound.org/browse/">http://www.freesound.org/browse/</a>	Audio
OER Commons	<a href="https://www.oercommons.org/">https://www.oercommons.org/</a>	Content
SkillsCommons	<a href="https://www.skillscommons.org/">https://www.skillscommons.org/</a>	Content
MERLOT	<a href="https://merlot.org/merlot/">https://merlot.org/merlot/</a>	Content
Teaching Commons	<a href="http://teachingcommons.us/">http://teachingcommons.us/</a>	Content
Google Images Advanced Search	<a href="https://www.google.com/advanced_search">https://www.google.com/advanced_search</a>	Image
Flickr	<a href="https://www.flickr.com/">https://www.flickr.com/</a>	Image
Openverse (CC Image Search)	<a href="https://openverse.org/?referrer=creativecommons.org">https://openverse.org/?referrer=creativecommons.org</a>	Image

The Library of Congress   Flickr	<a href="https://www.flickr.com/photos/library_of_congress/">https://www.flickr.com/photos/library_of_congress/</a>	Im
The Metropolitan Museum of Art Collection	<a href="https://www.metmuseum.org/art/the-collection">https://www.metmuseum.org/art/the-collection</a>	Im
Unsplash	<a href="https://unsplash.com/">https://unsplash.com/</a>	Im
Noun Project	<a href="https://thenounproject.com/">https://thenounproject.com/</a>	Im
Nappy   Beautifully Diverse Stock Photos	<a href="https://nappy.co/">https://nappy.co/</a>	Im
Google Advanced Search	<a href="https://www.google.com/advanced_search">https://www.google.com/advanced_search</a>	Me
Mason OER Metafinder (MOM)	<a href="https://mom.gmu.edu/">https://mom.gmu.edu/</a>	Me
OASIS Search	<a href="https://oasis.geneseo.edu/">https://oasis.geneseo.edu/</a>	Me
Open Textbook Library	<a href="https://open.umn.edu/opentextbooks/">https://open.umn.edu/opentextbooks/</a>	Te
OpenStax	<a href="https://openstax.org/">https://openstax.org/</a>	Te
OpenMichigan	<a href="https://open.umich.edu/find-open-resources-u-m">https://open.umich.edu/find-open-resources-u-m</a>	Te
OpenSUNY	<a href="https://textbooks.opensuny.org/">https://textbooks.opensuny.org/</a>	Te
The Open Video Project	<a href="https://open-video.org/">https://open-video.org/</a>	Vi
Internet Archive – Movies	<a href="https://archive.org/details/movies">https://archive.org/details/movies</a>	Vi
YouTube	<a href="https://www.youtube.com/">https://www.youtube.com/</a>	Vi



# RESOURCES FOR OPENHAWKS

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## Program documents

- Author-Publisher MOU – This is a template version of the agreement grantees sign with the Libraries.
- OpenHawks roadmap worksheet – Use this worksheet to help establish objectives, set goals, keep track of source material, plan dissemination and more.
- Completion checklist – Are you ready to have your OER archived with the Libraries? Review this checklist to see if you're ready.
- OER submission form (Google version)
- OER submission form (Qualtrics version) – When your project is ready to use (OER is never truly complete), the grant requires you to archive a copy in our institutional repository, Iowa Research Online. Use this form to provide a link to your project, as well as the information necessary for archiving and discovery.

## On-campus contacts

- Mahrya Burnett –OpenHawks coordinator
- Subject Librarians –Your department’s subject librarian can help you locate source material, navigate licensing issues, and connect with potential collaborators.
- Digital Publishing and Scholarship Studio –The Studio helps with the development, design, and implementation of digital scholarly research projects and publications. Request a consultation through the Studio website.
- Alyssa Varner–The Studio’s graphic designer. She can work with you to develop book covers for your open textbook, as well as other graphic elements.
- Nicole Villanueva –ITS support for UI Pressbooks
- T.M. Weissenberger–IT/Web Accessibility Coordinator
- Center for Teaching –Partner with the instructional designers in the Center for Teaching to better integrate your OER into your course, assess the impact of your project, select technological tools, etc.

## OER repositories for source material and examples

- OER Commons –This is a large repository of all types of OER across all education levels. Use the filters and

limiters to narrow your search results. OER Commons also includes a web-based authoring tool that you might want to try.

- Open Textbook Library–From the Open Education Network, this curated collection of open textbooks includes extensive faculty user reviews.
- OASIS Geneseo –This OER metafinder searches across 115 different OER collections. It can be a good place to start your search.

## OER authorship tools

- UI Pressbooks –Get your UI Pressbooks account from ITS by visiting this website and clicking on the link labeled “UI Pressbooks site request.”
- GitBook –You might consider using the GitBook platform to share materials created in GitHub. This platform is not supported by ITS.
- LibreTexts –This platform allows you to create modular OER remixes from existing content libraries. You can also add and edit your own content. This platform is not supported by ITS.
- JupyterLab and Jupyter Notebook –Development environments for creating and sharing computational documents for data science, scientific computing, computational journalism, machine learning, etc. This platform is not supported by ITS.

## Accessibility and DEI

- [Accessibility@Iowa](#)—This collection of digital accessibility resources can help you create documents and web resources that are usable for all.
- [Accessibility 101](#)—A set of accessibility checklists, guides, demos, and other resources for instructors.
- [UI DEI Style Guides](#) –These style guides can help you avoid language biases and make your writing more inclusive.

## H5P and other interactive content

- [LibreTexts ADAPT](#) – An open homework system that allows users to create embeddable assessments from new and existing questions.
- [H5P.org](#) –This platform allows you to create a variety of H5P interactive activities, which can then be shared through any H5P-capable authorship tool.
- [Pressbooks H5P](#) –You can also create H5P activities directly in Pressbooks. [This link](#) tells you how.

## Openly licensed images and media

- Google Advanced Image Search –Use Google’s advanced image search interface and select “Creative Commons licenses” under “usage rights” to find openly licensed images for your OER.
- New York Public Library Digital Collections –This large collection of digitized content includes prints, photos, maps, manuscripts, streaming video, and more.
- Unsplash –Openly licensed, high-resolution images
- YouTube –YouTube is still the most comprehensive place to find video content. Try filtering results by Creative Commons license.

## Video creation and editing

- UI Digital Media Services –Services include all aspects of media production, including scripting, filming, and editing. We also support live streaming, podcasts, and audio production. There is a cost associated with this service.
- One Button Studio—Use the Libraries’ OBS to record and save your video projects.
- Teach Online Media Studios –Distance and Online Education provides studio spaces equipped to produce

live and recorded media for those who teach online.