

# Creating an OER that Lasts: A sustainable model for design, publication, and maintenance

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**Key Words:** Open Educational Resource, Sustainability, Accessibility

## Abstract

The global COVID-19 pandemic brought about a number of changes to educational practices, including how academic support units distributed teaching materials to students and educators within and beyond their local contexts. Recognizing an opportunity to share its materials to members of the Auburn University community and beyond, University Writing (UW), an academic support unit at a large, R-1 university, created an Open Educational Resource (OER) that published its extensive library of over 300 writing instructional materials. Throughout the project, UW's OER team members worked to develop a sustainable model for accessible OER design, publication, and maintenance, which we share in this article, accompanied with recommendations for other OER designers. Our scalable model offers a theoretical framework for OER sustainability using principles of **accessibility, labor, cost, usage, and longevity**. Our emphasis on accessibility fulfills online literacy instruction (OLI) principle 1: "Online literacy instruction should be universally accessible and inclusive." Further, the principles we identified for OER sustainability demonstrate our commitment to "regular, iterative processes of...instructional material design, development, assessment, and revision to ensure that online literacy instruction and student support reflect current effective practices" (OLI principle 3).

## Introduction

The COVID-19 pandemic significantly impacted educational practices, including how academic support units disseminated teaching materials to students and educators within and beyond their local contexts. As documented by Lazar (2022), a positive development resulting from the pandemic was an increase in knowledge amongst educational program administrators of the need to provide learning resources in digitally accessible formats. Recognizing an opportunity to distribute its materials to members of the university community and beyond, University Writing (UW), an academic support unit at Auburn University, a large, R-1 university, created an Open Educational Resource (OER) that published its extensive library of over 300 writing instructional materials as an open access resource. These instructional materials took the form of informational handouts, rubrics, and writing guides that addressed a wide range of writing challenges and genres across disciplines. By creating and publishing the UW OER, UW was better able to fulfill its values of accessibility and empowering writers.

The UW OER project posed a number of challenges from its initial conception to its publication and maintenance. Even though a relatively large team was dedicated to the project, it was difficult to manage due to its scope at times. All materials required retrofitting for accessibility, a laborious process detailed in a publication by UW OER team members Katharine H. Brown, Mark Smith, and Heesun Yoon (2023). Further, UW writing program administrators did not have expertise in web design. To address these challenges, the team worked collaboratively within and outside their unit and designed a clear workflow for all project stages. The initial launch of the UW OER was an intensive, 5-month project taken on by a dedicated team, and its maintenance is ongoing. Once the UW OER was published, a new challenge emerged: how would we sustain it over time? OERs, like all digital products, can be susceptible to link rot and file errors. For our OER team, priorities shifted towards sustainability. Throughout the project, we have worked to develop a sustainable model for accessible OER design, publication, and maintenance, which we share in this article, accompanied with recommendations for other OER creators. Our scalable model offers a theoretical framework for OER sustainability using principles of **accessibility, labor, cost, usage, and longevity**. By detailing our process of OER development, we provide an adaptable model that can reduce time and labor for other creators of OER projects of different sizes.

## Institutional Context

UW is a Writing Across the Curriculum/Writing in the Disciplines academic unit housed within the Provost's Office at Auburn University. Staffed by a collaborative team, UW offers a number of programs to faculty, staff, and students across disciplines. Its largest program is the Miller Writing Center, which employs over 40 student workers who provide one-on-one writing consultations and staff the front desk. Beyond the writing center, UW offers programs for graduate student writers, including writing retreats, writing groups, and semester-long writing programs. It also partners with faculty by facilitating writing workshops within their classes and guiding their development of high-impact writing assignments, especially ePortfolios.

“ Our scalable model offers a theoretical framework for OER sustainability using principles of accessibility, labor, cost, usage, and longevity. ”

While developing its programs, UW's staff has created hundreds of PowerPoints and informational handouts. Recognizing the value of this internally-facing library of instructional materials, UW's team envisioned a new project: the publication of an OER that allowed members of Auburn University's community, as well as educators and learners around the world, access to its materials. Thus, the publication of UW's OER embodies and reaches beyond the values described in UW's vision statement: "University Writing's vision is to empower the Auburn community through diverse, equitable, and inclusive writing and instructional support." The UW OER is utilized by multiple communities of educators and learners at Auburn University and beyond, and it contributes to conversations about effective writing education. For example, the UW OER is a feature of conversations about ePortfolios across institutions. New instructional materials on graduate student writing in STEM fields are being developed with support from a National Science Foundation (NSF) Innovations in Graduate Education (IGE) grant. Graduate assistants, librarians, and faculty are working to develop materials specialized to their academic fields for new, discipline-focused sections. Stakeholders at Auburn University and locally have requested to co-author materials with us on various writing-related topics for OER publication. Thus, the UW OER is a fluid, dynamic body of knowledge that adapts and grows in support of diverse communication needs. Below, we ground our OER developmental process to literature, specifically identifying key principles and values that were central to creating the UW OER at Auburn University.

## Supporting Literature

### *Open Education Resource (OER)*

UNESCO described OER as educational materials available within the public domain with licensing for others to reuse and adapt (UNESCO, 2019). Although UNESCO described OERs as existing in "any format and medium" (UNESCO, 2019), the majority of OER creators have developed open-access, free online textbooks, particularly for undergraduate courses (Dozier, 2021). In many cases, OER projects are motivated by a recognition that textbooks, which have risen in price at triple the inflation rate since 1977 (Luo et al., 2020), create a financial barrier for many students. In fact, studies have estimated annual textbook costs for university students as between \$1200–\$1500 and have connected the prohibitive cost of textbooks to students' decisions around enrollment and persistence (Dozier, 2021). In response, some universities have absorbed the cost of creating textbooks in the form of OERs.

With the increasing reliance on distance learning due to the COVID-19 pandemic (Tang, 2021), OERs have been in high demand, and research demonstrates their value for student learning. For example, students' scores improved when their learning was supported with the use of an OER, especially for those unable to afford the high cost of textbooks (Colvard et al., 2018). As free teaching and learning resources available online to anyone with an internet connection, OERs can respond in part to educational inequities related to socioeconomic background and function in partnership with efforts to enhance inclusion (Navarrete & Luján-Mora, 2018), particularly when their design has been attuned to students' backgrounds, needs, and experiences. We envisioned the UW OER as an equitable and inclusive project; students and professors at Auburn University and beyond could access our teaching and learning materials for free at times convenient to their schedules. Further, our materials were licensed for use, reproduction, and modification and could be downloaded and saved for use when an internet connection would not be available. While the UW OER featured in this article is not a textbook, our library of writing instructional materials similarly addresses students' sometimes limited ability to access expert writing instruction in accessible, asynchronous, online formats.

## Accessibility

In an effort to improve its ability to serve diverse learners, UW adopted Universal Design for Learning (UDL), which is a framework that guides educators to create multiple pathways to achieve a learning goal (CAST, 2018). Through offering learners choices in how they interact with material, educators utilizing UDL seek to empower learners to discover how they best learn and to make choices that support their growth. A significant aspect of UDL is the recognition that educational resources that lack accessibility reinforce a barrier to learning for students with disabilities. Drawing on UDL, we emphasized accessibility in all stages of OER creation. We believe that accessibility is essential for equity in OER designs (Azadbakht et al., 2021).

While conversations about OER accessibility are growing, they may be hampered by a lack of agreement on what is meant by accessibility. For instance, in our search of the literature, we found authors used the term *accessibility* to describe the labor required to adapt online materials for classroom contexts (Luo et al., 2020; Zeichner, 2020). Another usage of the term described students' consistent access to technology so they could utilize OERs (Luo et al., 2020). While these are important considerations for OER designs, we define accessibility as the readability of all OER materials by learners with visual, auditory, physical, and cognitive disabilities. Through accessible design, we bolster the usability of our materials, and we align our project with UDL's emphasis on empowering students to achieve their learning goals through reducing barriers to learning, with the understanding that accessible design benefits all learners. Thus, as we defined inclusive practice within the OER project, we grounded that definition in 1) digital accessibility so users with disabilities could access content in multiple accessible file formats; 2) downloadability so users with unstable internet connections could have permanent access to content; and 3) free public access so cost was not a prohibitive barrier to viewing and downloading materials.

Although nearly 1 in 5 college students has a disability (NCES, 2021), accessibility measures are often not prioritized in OER designs; for instance, an assessment of 355 open textbooks' WCAG compliance found failure rates of over 75% in their use of accessible headings and alt text in Word and PDF documents (Azadbakht et al., 2021). Additionally, a survey of 193 librarians found that slightly less than half always considered accessibility when helping faculty create OERs, and fewer than one-third considered accessibility when deciding whether to add an OER to their library collection (Schultz & Azadbakht, 2021). Based on our experiences with OER development, we suspect that several issues influence this lack of accessibility: 1) the steps required to create accessible resources are challenging and not widely known; 2) the cost and labor required to develop an accessible OER are steep; and 3) conversations about accessibility are often not a central part of faculty development. While accessibility requires learning and labor that may deter educators from designing accessible resources, accessible OERs can be used by more learners and contribute to educational equity, fully justifying the cost and labor of accessibility.

## Sustainability

When we centered accessibility throughout the UW OER creation process, we recognized that we would need to create a sustainable model for OER development and maintenance. Within the literature, OER sustainability is a term that encompasses four elements: **labor, cost, usage, and longevity** (Downes, 2007). Addressing cost, specifically, Tlili et al. (2020) studied sustainability models across OER literature

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and identified 10 sustainability models, all of which focused on the cost of producing OERs and their sources of funds. We expanded our focus on sustainability beyond cost and funding; instead, we considered the four elements identified by Downes (2007) and added a fifth element—**accessibility**—to align with our valuing of accessibility and inclusivity, which we describe above. Through sustainable project design, OER creators can meaningfully address these five elements throughout intentional processes for OER design, publication, and maintenance. Creating an OER can be overwhelming, but our scalable model offers a pathway to manage these large projects for teams of varied sizes.

The UW OER is fairly unique; rather than creating a textbook, we published a wide-ranging set of instructional materials related to writing genres, disciplines, processes, and challenges. Our materials aim to improve faculty support and educate students across disciplines. One-third of our OER materials are intended to support faculty in the teaching of writing, while the remaining two-thirds of materials are for student writers across levels and disciplines. Further, the UW OER helps us recognize opportunities to grow our own expertise by addressing gaps in information.

By focusing our attention on our experiences creating and maintaining the UW OER, we offer a unique contribution to OER literature. Although Otto et al. (2021) identified a research gap around OER user experience, we also see a gap in the literature around the experiences of creating an OER. Our companion articles respond to this gap. [In an article written by OER team members Katharine H. Brown, Mark Smith, and Heesun Yoon \(2023\)](#), we explored our processes of creating accessible documents for the UW OER to support user-friendliness for learners with disabilities. In this article, we deeply explore our experience of creating the UW OER, especially our work to develop a sustainable model for OER design, publication, and maintenance.

## Project Design

### *Initial Concept & Goals*

The driving inspiration to create the UW OER began when the founding director of UW, Margaret Marshall, drew on her background in archival research and sought to review and organize the shared UW file drive before her retirement. As is the case with most writing programs, UW's team had developed hundreds of handouts and PowerPoint presentations while delivering student- and faculty-facing programming over a decade. These instructional materials were given to program participants and were often reused or adapted as similar programming was delivered each semester; however, there had not been a systematic review of these files, leading to the pile-up of thousands of documents.

Marshall's project resulted in a digital archive of UW's materials that the team continues to use and develop; developing the archive happened in parallel with team conversations about reuse and accessibility policies for programmatic materials. Because resources had been created by different program administrators over time, files lacked design consistency and did not meet WCAG accessibility standards. This was concerning for two reasons: first, the administrative team had recently devoted more time to learning technical accessibility practices as well as UDL practices, yet the body of resources did not reflect that knowledge; second, these resources were regularly accessed by students and faculty who likely had accessibility needs we were not meeting.

While considering reuse and accessibility policies, the administrative team was also working on an NSF IGE grant with faculty in Auburn University's Samuel Ginn College of Engineering. A weighted aspect of the NSF review process related to "dissemination," or plans the research team had for distributing their work to the academic community beyond a single institution. As part of the NSF IGE project, engineering faculty would adapt our existing materials and create new materials for STEM audiences for dissemination within and beyond Auburn University.

The creation of the UW OER would respond to our need to share our resources widely. A public-facing OER could house existing UW materials that we would redesign to meet new program standards in accessibility, and it could share materials developed through the NSF IGE grant. Not only would the UW OER benefit the Auburn University community by more consistently ensuring faculty and students could access writing instructional materials asynchronously (regardless of their ability to attend UW programs and events), but it could also be used to alleviate administrative and teacher labor at other colleges, universities, and k-12 schools with more limited financial support and personnel.

Because the UW OER would be housed on UW's website, we anticipated challenges with publicizing it. To address this challenge, we decided we would publish a press release through Auburn University each semester highlighting OER materials. We would also communicate the existence of the UW OER in all workshops, presentations, and class visits. Beyond Auburn University, the UW OER would function as a vehicle to share our materials with other institutions. Accordingly, we have presented on our OER project at conferences and have written about it here and elsewhere (Brown, Smith, & Yoon, 2023).

To create the UW OER, we needed to account for our team's strengths and limitations. Administrators in UW had backgrounds in education, English, and rhetoric and composition, with strengths in project management, planning, and communication. However, we lacked the technical ability to code a website. As part of a large university, we had to work within the institution's existing site framework (a Cascade site with administrators having limited backend access to modify content). Thus, our ability to imagine an OER was different from our ability to build an OER.

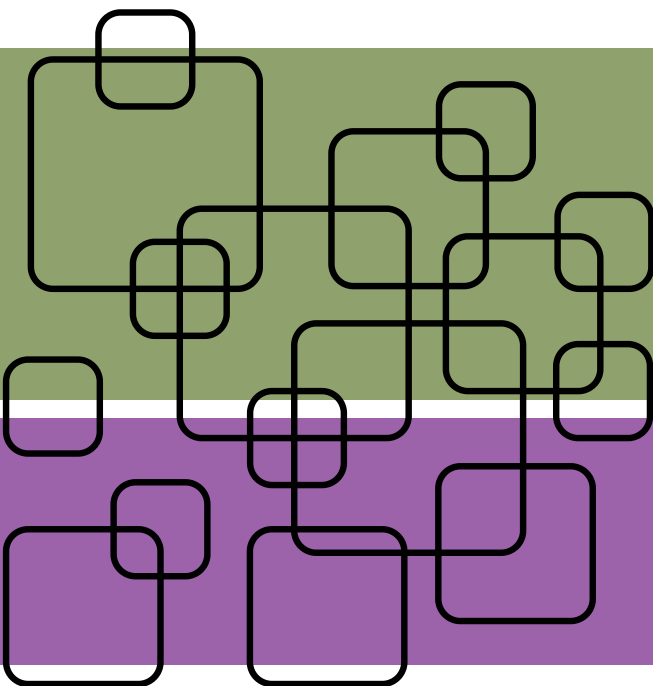
Early discussions about what the UW OER would look like prioritized several key characteristics: searchability, accessibility, and the ability to easily update materials. Searchability was prioritized because we had hundreds of documents to move onto the OER site and would continue to develop entries as new documents were created. While the number of materials created the potential to offer UW OER users a variety of writing support, it also could be overwhelming as users tried to locate the document(s) most relevant to their writing and teaching needs. Accessibility included rich content editor features, like the ability to use tagged headings and list formats, in addition to the ability to include both Word and PDF versions of each resource and usability across different devices (laptop, tablet, smartphone). Finally, we hoped to leverage the affordances of the digital OER by regularly updating and adding to the bank of resources. We needed to be able to do this internally, with members of our team, without IT intervention.



After some deliberation, we decided to use a blog-style shell to house the UW OER. A blog template was available through the Cascade backend layout options. The layout template was accessible across devices and included a rich content editor that allowed us to format heading styles. There were also search functions that could help users locate keyword tags attached to each blog entry in addition to using an open search bar to search entry descriptions for keywords and phrases. For example, users hoping to find writing instructional materials on reflection could browse the sidebar list of keyword tags and click on “reflective writing” or type “reflection” into the search bar and hit enter.

While we could have housed all the media files on the backend media library in Cascade, AU had recently purchased an institutional license for Box Drive, which is a virtual shared drive account similar to Google Drive or One Drive. Box Drive was already being used within our office as a virtual collaborative space and housed all of the refined files Marshall had reviewed and organized. Link sharing meant that file formats could easily be embedded within blog entries, forging a connection between the UW OER site and our shared file drive. The main advantage of using Box Drive was that members of the team could make small changes to our OER files without having to upload new versions of files and repair links. When files had to be totally revised, a “replace file” option allowed the OER team to replace the file in Box Drive without corrupting the link shared on the blog. Put differently, files could be edited and maintained in the Box space without severing the connection to our OER entries. Usage data in Box Drive also had the ability to track views and downloads for assessment. Because the UW OER publishes external links to documents that are housed in Box Drive, the UW OER can be more easily migrated to new platforms should the university change one or both platforms, which enhances our OER’s sustainability.

With the logistics in place, the administrative team developed a list of writing keywords that would become entry tags. They drafted UW OER topic sections and section descriptions for the existing materials. These lists and drafts went through several iterations over three months. Once the structure for the UW OER was determined and the copy for each section was drafted, a student team (Katharine H. Brown, Mark Smith, Heesun Yoon, and Ved Deepak Soni) from UW and the Miller Writing Center were assembled to begin the process of adapting hundreds of documents to meet accessibility and design standards so that they could be added to the site.



## Project Publication

### *OER Team's Process*

The OER team, which was composed of four UW student workers, was responsible for two major tasks, retrofitting documents for accessibility and publishing them to UW's website. Katharine H. Brown, then a Graduate Program Assistant who had worked for UW for 3 semesters, was the team leader. Mark Smith and Heesun Yoon, both Undergraduate Program Assistants, had been newly hired, and the OER project would be their first work assignment with UW. Finally, Ved Deepak Soni, a Graduate Writing Consultant, joined the project after the writing center, which is open fewer hours during summer semesters, was unable to offer him as many hours as he had requested.

The OER project was originally conceptualized as a summer project that would take approximately three months to complete. The full-time administrative team shared with Katharine a tracking document that listed all materials requiring retrofitting and allowed her to manage the project independently. [A template version of the tracking spreadsheet](#) is available on the UW OER for use by OER creators. With over 300 materials requiring retrofitting, as well as the fact that all team members were relatively new to document accessibility and website updates, it was clear that Katharine would need to strategically design a workflow and designate responsibilities.

The project launched with the initial onboarding of Mark and Heesun. During their full day of orientation to their new positions, Katharine scheduled time to introduce the project and make sure they had the needed programs downloaded onto their computers using their institutional software license (Microsoft Word, Adobe Acrobat DC, and Box client). While introducing the project, Katharine shared tips on navigating UW's library of over 5,000 files in Box and demonstrated how to download and save UW's Word document template, which had been developed for the OER project. Next, she gave some time to practice using the template, especially its headings. This same orientation was given separately to Ved, who joined the project slightly after Mark and Heesun were hired. OER team members Katharine H. Brown, Mark Smith, and Heesun Yoon (2023) explored the importance of the template, as well as the technical side of document accessibility, [in a companion article which we refer to throughout this article](#).

As a next step toward launching the team's work with document accessibility, Katharine scheduled the first team meeting. The meeting began with a discussion of UDL, the theory that informed the UW OER project's emphasis on accessibility, as well as statistics on disability in the United States, especially among college students. By contextualizing the project, Katharine hoped to share pride of ownership in the project and to equip team members to make difficult decisions about how to achieve document accessibility, a task that was rarely straightforward. Next, the team studied principles of document accessibility, especially mobility, visibility, audibility, and searchability, and explored practices that supported those principles, such as alternative text for image audibility, headings for navigability, high contrast colors for visibility, and metadata for searchability (Brown, Smith, & Yoon, 2023). Because the steps required for accessible document design would be different for Word and PDF documents, the team focused on Word documents alone during the early stages of the project.



As part of this team meeting, Katharine designated each team member's immediate responsibilities. In the tracking document, materials had been divided across sheets based on their purpose and audience, and Katharine assigned sheets based on team members' professional goals. For example, Ved, who was considering the possibility of a faculty position post-graduate school, tackled the Faculty Resources sheet, which housed 61 linked documents. Mark and Heesun, who were preparing for writing-focused careers, shared the largest sheet, Student Resources, with 120 linked documents or folders of documents. Katharine addressed the remaining sheets, which housed links to 34 documents or folders of documents that had been created for administrative or faculty professional development. Additionally, Katharine handled a sheet the team added, Unfinished Resources, where team members moved documents that required significant detective work to locate missing information, such as authorship, creation date, or references, or that had out-of-date or incomplete content. Finally, the team identified a regular time each week for team meetings, in which they would continue to collaboratively explore and address document accessibility.

With the foundation of the OER team built and the overall conceptual ideas understood by the team, these techniques needed to be implemented. New materials would be created with accessibility and the UW OER in mind; however, that left a huge backlog of documents that were created in the years prior that needed to be retrofitted for accessibility. This retrofitting was broken down into four key steps—creating the new Word documents, reviewing and editing the new Word documents, creating the new PDFs, then reviewing and editing the new PDFs—which are presented in greater detail in *Figure 1*.

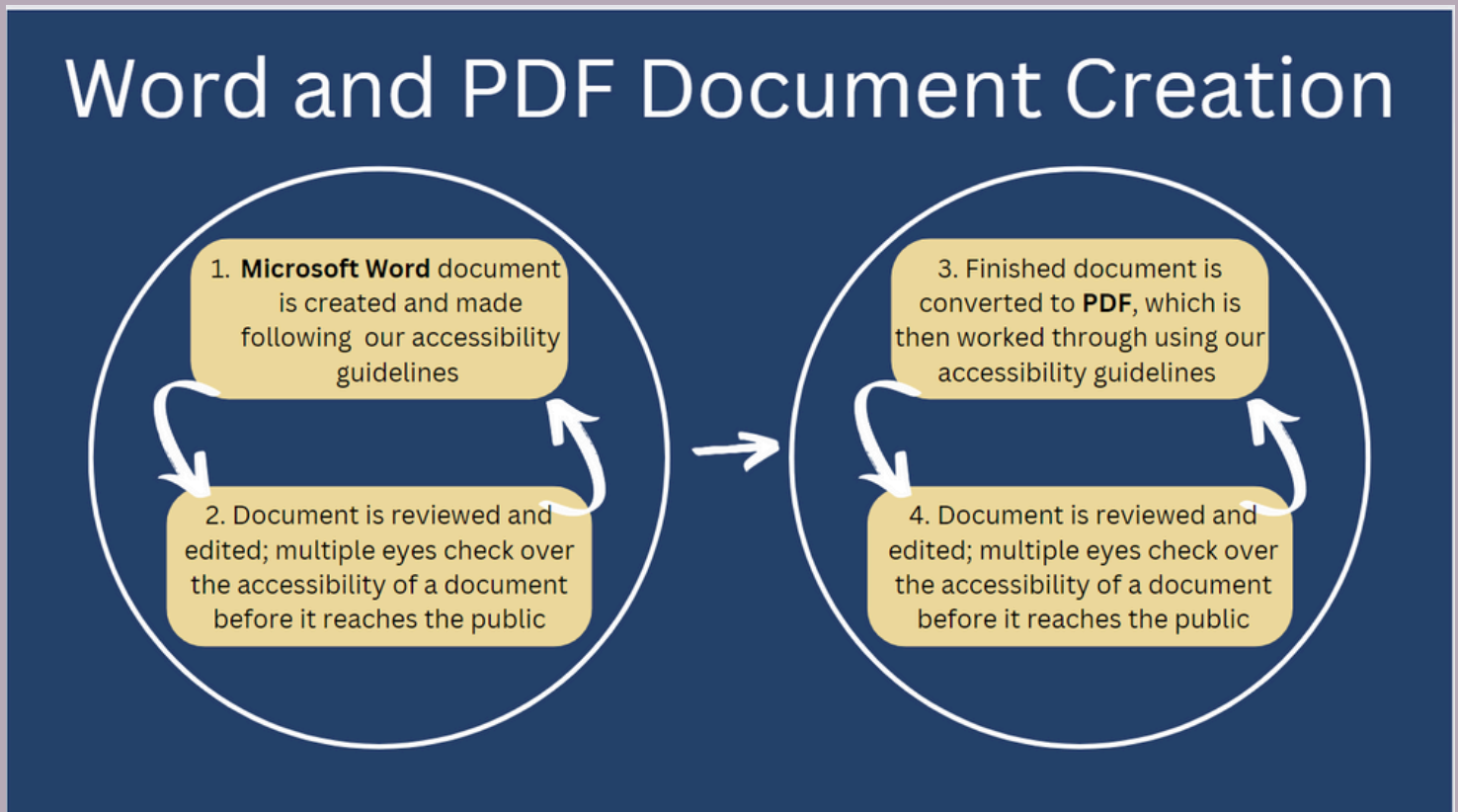


Figure 1: A visual illustration of the relationship between Word document development and PDF document development.

Word documents were the first building block in our production of the blog-style UW OER. We began by creating Word documents for each resource because Word documents are easier to make accessible, and we emphasized accessibility features such as color contrast, sans serif font, alternative text, and headings. We began by moving existing content into our custom Word template. The template allowed us to establish a cohesive look for all OER documents and to consistently use accessible features. Word documents can be easily edited so that important aspects of accessibility can be achieved; moreover, many of these accessible elements can be preserved when converting the Word document to PDF. Thus, Word was our medium of choice for the initial set of accessible documents. To learn more about our retrofitting process of redesigning our existing writing instructional materials into accessible Word documents, read our companion article and watch our instructional videos outlining the design of these documents ([Brown, Smith, & Yoon, 2023](#)).

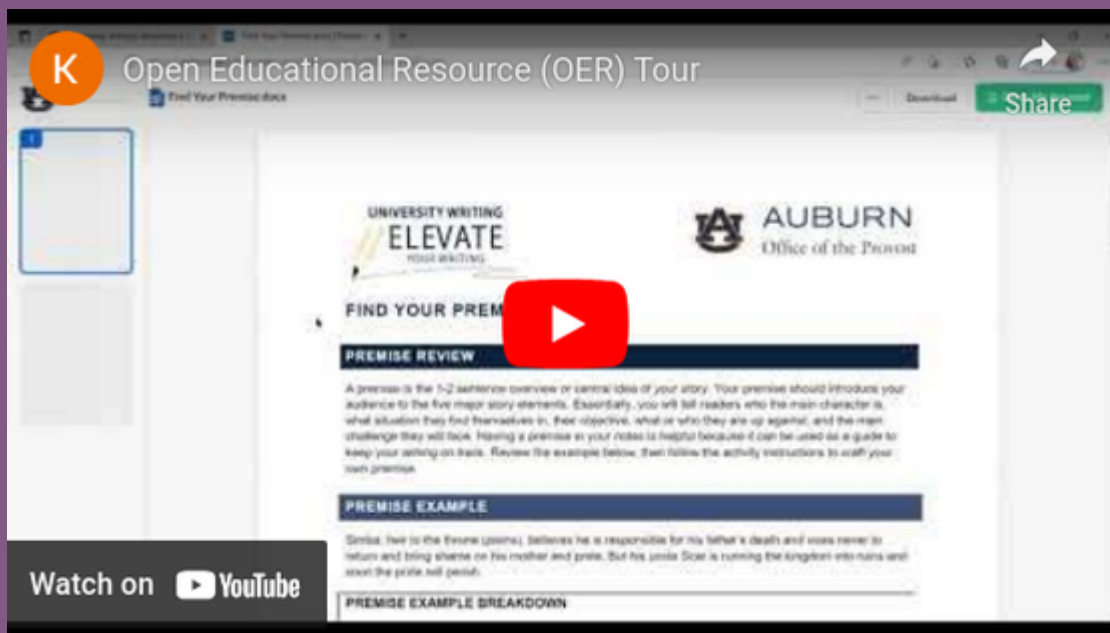
After Word documents were created, they needed to be reviewed by the OER team and uploaded to Box. After completing a document, a team member would record its completion in the tracking spreadsheet that housed links to all UW documents eligible for publication. A [tracking spreadsheet template](#) is available in the UW OER. Next, Katharine reviewed new Word documents for any accessibility or content errors and provided feedback. With this process, there was no waiting for a review to be finished; as soon as a team member uploaded one document, they could move on to another and then return to make corrections later, saving time and alleviating pressure for a quick turnaround. Any matter that Katharine believed the entire group should be aware of was brought up at weekly meetings to make sure the group edited documents consistently and could anticipate challenges.

After the OER team retrofitted all materials in Word, they converted these documents to PDF, which is a more difficult medium to make accessible. This conversion can be done by installing Adobe Acrobat, and then using the Acrobat ribbon in Word to convert the document. Once we created a PDF, we added fillable fields, such as text boxes, check boxes, or radio buttons, and we set the reading order. Fillable fields turn PDFs into interactive documents where readers can type their responses to reflective questions, complete checklists, or answer multiple-choice questions. By setting the reading order, we provided a pathway for screen readers to navigate documents. When team members created new PDFs, they updated the tracking spreadsheet, and Katharine reviewed PDFs and provided feedback as needed. We published all materials in both Word and PDF formats on the UW OER. Word documents can be made more accessible than PDFs for those using assistive devices like screen readers, but PDFs can be opened with a wide range of programs. For more information about the conversion of Word documents to PDF, read our OER team members' article, which contains a video detailing the process ([Brown, Smith, & Yoon, 2023](#)).

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We began by creating Word documents for each resource because Word documents are easier to make accessible, and we emphasized accessibility features such as color contrast, sans serif font, alternative text, and headings. We began by moving existing content into our custom Word template. The template allowed us to establish a cohesive look for all OER documents and to consistently use accessible features.

After retrofitting documents, we needed to publish them online through Cascade, with links to our public-facing Box folders. The UW OER organizes resources topically, and it addresses a wide range of writing processes, challenges, and genres. Once we established section topics, we wrote section descriptions to give the reader a sense of what content would follow, and then we added brief descriptions of each resource to preview their content. Each section is tagged with searchable keywords that correspond with the metadata tags we added to each document. In the video below, Katharine gives a quick tour of the OER, describing its organization and searchability.



Video 1: Open Educational Resource (OER) Tour

## Project Maintenance

Creating an accessible UW OER was only one stage of our project; we also needed to establish a sustainable process to maintain the UW OER that distributed labor across the entire UW team. First, all members of UW trained in the production of accessible documents, as over time the original OER team members would graduate or lessen their role in the project, creating the need for others to be able to handle the project. While this effort to improve knowledge of accessibility practices was underway, we developed a system for Katharine H. Brown, Mark Smith, and Amy Cicchino to update existing OER documents and publish new documents at the end of each semester. Throughout the semester, team members produced accessible materials. If a document's author (i.e., the person who was creating the original writing instructional material) wanted to publish their work to the OER, they recorded the document's information and description to a UW OER library spreadsheet utilized by the OER team to track website maintenance and updates. [A template version of the library spreadsheet](#) is available in the UW OER. Near the end of each semester, the team of three would make the requested changes. When the OER team found accessibility issues, they returned these materials to their authors for revision so they could improve their knowledge of accessibility. This process is illustrated in Figure 2.

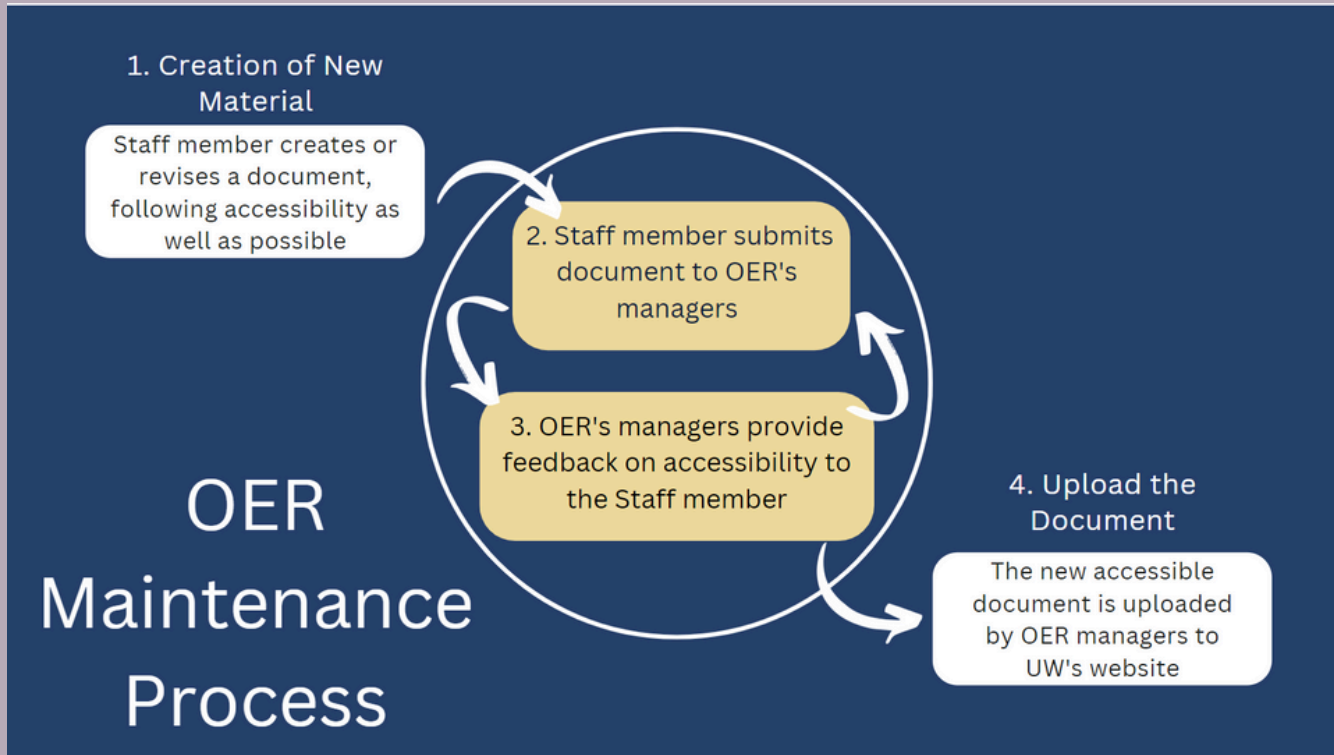


Figure 2: The four-step process of OER maintenance

When authors of instructional materials graduated or moved to positions elsewhere, we continued to use, adapt, and update their work. If we made significant updates, we modified the document's footer to add new authors' names while also retaining the names of original authors. OER project designers should consider how to manage questions of authorship and attribution when staff turnover occurs.

## Discussion: Towards a More Sustainable OER

In the sections below, we unpack our framework for OER sustainability, identifying five principles: accessibility, labor, cost, usage, and longevity. By their digital nature, no OER is static. OER sustainability becomes a particular issue with OERs that house e-learning materials for students, faculty, and staff. Unlike OER textbooks, which might have set dates for revision and re-issuing, UW's OER was constantly developing due to new programming and resourcing. Additionally, sustainability would need to fold into the regular labor of program administration. Diaz Eaton et al. (2022) discussed OER sustainability, highlighting the cyclical nature between creating, adapting, using, refining, sharing, and finding resources. They also noted how challenging it is to complete this OER lifecycle. Likewise, we needed to intentionally plan a process for sustainability and found principles of accessibility, labor, cost, usage, and longevity to be helpful in developing such a framework.

### *Accessibility*

As stated in our literature review, we align our accessibility emphasis with UDL principles and identify accessible document design as a central principle in OER design and sustainability. Accessibility was most labor-intensive at the beginning of the UW OER creation process as staff and students needed to be trained

in accessible document design, and a large number of inaccessible documents needed to be retrofitted. Moving forward, our time commitment to maintaining the UW OER has been drastically reduced. We do not expect to do any more retrofitting, as accessibility training has become a regular part of onboarding for our full-time staff. Now the OER team assesses documents for accessibility and sends them back to document authors if edits need to be made. Thus, the project will be sustainable over the long term.

We believe that the project situates us as participants in creating a culture of educational equity, both within UW and our institution. After publishing the UW OER, we had the opportunity to facilitate accessibility training for faculty and staff across our university. We have also presented our accessibility work in a student newspaper and at an academic conference. We strongly believe that our emphasis on accessibility allows more students to feel seen, supported, and represented, which is essential to OER sustainability. We have documented our accessibility protocols in [an Accessibility and Inclusivity Guide](#), which is publicly available on the UW OER.

### *Labor*

An OER's presence as a living, digital repository is exciting, provided labor is available to conduct the necessary upkeep. While startup labor can often be funded by internal or external grants, the ongoing labor for sustaining an OER can sometimes be overlooked. UW has immense privilege in this sense: as an independent WAC program with a team of five full-time administrators, up to ten graduate student program assistants, up to two undergraduate program assistants, and approximately forty undergraduate and graduate student writing center tutors, there were opportunities to fold sustainability labor into existing job duties and responsibilities. Having such a large team made building an extensive UW OER achievable, and each team member brought to the project a variety of backgrounds, identities, experiences, and areas of expertise. As an example, UW's graduate program assistants have a variety of academic backgrounds beyond English and education degrees and have studied and taught in international contexts. Their rich multicultural and educational experiences are reflected in the materials created for the UW OER.

Even with the ability to properly compensate and designate OER maintenance labor, the process still needed to be mapped and planned. Specifically, this planning process should identify a timeline and process.

- *Timeline:* When will OER maintenance be conducted during the academic year? Programming was typically planned and delivered, and materials were refined, throughout the semester. As a result, UW OER updates and additions occur after each fall, spring, and summer semester.
- *Process:* An OER is often a collaborative undertaking, and sustainability involves creating clear pathways for all constituents to have a voice in updating materials. However, the labor of communicating across OER contributors can be challenging. For that reason, we encourage the development of asynchronous processes to identify materials that need to be updated, added, or removed from the OER. While developing this process is important, equally important is regular training of team members so the process is used effectively.

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Within the labor process, workflow relates to the system of ordering and distributing tasks within a larger process. Mapping can be one helpful way of planning this workflow, and we encourage OER teams to map their imagined sustainability workflow procedures out as a final stage of OER creation. After this workflow is developed, process documentation can ensure the knowledge is retained as staff turns over or retires. We share [our process document](#) as an example in hopes that programs are able to adapt or reuse the document in developing their workflow process.

### *Cost*

Cost can include both monetary resources and time devoted to developing and sustaining an OER. While some of this cost can be covered by external or internal temporary funding avenues, we encourage programs interested in developing OERs to ensure long-term OER sustainability costs are folded into their programmatic budgets. Tlili et al. (2020) identified ten methods for funding and sustaining OER costs, including internal funding, OER networks and consortiums, public funding, endowments/donations, sponsorship/advertisement, learning services, selling learning-related data, OER on-demand services, OER authorial labor, and a community-based model (p. 8). While we find these options to be useful methods, we discourage programs from committing to OER development without considering long-term solutions for cost. Put differently, if institutional stakeholders want an OER developed, they should not expect already overworked faculty, staff, and administrators to take on this labor without properly resourcing the initiative. This may include the addition of a budgetary allotment for the OER and the recognition of OER responsibilities in employees' job descriptions — with the ability to count that labor in promotion and evaluation criteria. UW recognized OER creation and maintenance as part of employees' job duties, folding the cost of maintaining the UW OER into the existing program budget. Further OER work is included in those employees' professional goals and accomplishments documents, which are used in annual evaluations of performance.

### *Usage*

Usage includes one's ability to access, download, and use existing OER materials as well as a program's ability to trace user activity. While usability is a characteristic that is primarily considered as the OER is being built, as OERs grow in their number of materials, usability must be revisited to ensure the OER remains navigable, searchable, and accessible. Further, the fragility of digital materials can result in broken links, meaning existing materials must be checked for their ability to function as they are intended to be used.

Usability also includes the traffic and use of the OER site. Measuring how many users access the site and its resources can help assess OER impact for institutional stakeholders. [Google site analytics](#), for example, can further drill down usage statistics, showing if users are located within the regional vicinity (and are likely students, staff, and faculty of the institution) or if the OER is being visited by users from across the nation or globe. Changes in usage data can directly correlate to promotional strategies such as sharing the OER at a national professional conference or contacting faculty on campus with reminders that the OER houses writing instructional materials that can be adapted for their courses.

Aside from site visits, the way an OER is used should also be further analyzed to identify users who view and download resources. View and download accumulations can provide data that shows deeper engagement than landing on and leaving an OER's main page. Because UW's OER uses shared Box Drive files, view and download statistics are collected each time a user accesses a particular file on the OER site. Although, as we

will discuss below, accessing those data using institutional technology infrastructure proved to be more challenging than we initially thought.

We encourage programs interested in OER development to consider how they will track and make visible their OER's use in ways that explain the impact these materials can have on institutional, regional, national, and global communities.

### *Longevity*

Longevity ensures an OER is capable of a sustainable lifespan, meaning an OER should not need to be made and remade each year or semester aside from ongoing maintenance. A plan for longevity should reach across team members. After facing significant turnover within UW, we encourage OER creators to take deliberate measures so that an OER and its processes do not live with a single individual in the office. While Katharine is now our full-time staff OER champion (having been recently hired as Associate Director of UW), it's important that if she were to win the lottery and leave UW, the UW OER would be able to persist in her absence.

Longevity further factors into the UW OER's sustainability, given its reliance on student workers. Undergraduate and graduate student workers are, by their very roles, a transient population. Unlike writing programs housed in traditional English departments, we are a centralized WAC program that employs students from across the disciplines. While this is a strength to our programmatic diversity, it means we often lose student workers when positions more relevant to their disciplinary and professional aspirations are opened. Most student workers spend two years working with the UW office. Therefore, it's important that we have a clear process for onboarding new student workers and training them to document their workflow in case of their departure. We see this turnover as an opportunity to share our knowledge of accessibility in other contexts and to train more people in accessibility standards. Each member of the OER team has expressed the intention to practice and advocate for document accessibility in future workplaces. Moreover, new teams of student workers will be trained in accessibility and will continue to communicate its importance.

To achieve longevity, a timeline and process for OER updates need to be made. At UW, we have achieved longevity through a combination of process documents and reiterative training. Process documents, [like the one shared here for updating the OER each semester](#), externalize what is often internalized or implicit knowledge. Aside from creating a more transparent and accessible process, these documents are especially handy for the onboarding and training of faculty, staff, and student workers.

## **Limitations and Constraints**

### *Limitations in Technology*

No OER project is perfect, and we had to make compromises and concessions in the development of UW's OER. First, we were limited in our technological abilities to build the OER we imagined. As part of a larger institutional infrastructure, we were required to work within our university's web content management platform, Cascade. Cascade is not a WSISYG platform but instead relies on widgets, plugins, and embedded

code to alter web content, making it more difficult to design a dynamic library. In working with IT on campus, we were told it would be most possible to create UW's OER using a blog format, which could include a search bar and keywords, two essential features for navigability and usability. However, we were constrained by how blog entries on writing topics would appear and were limited in our ability to share unique links to blog entries, making sharing individual entries a challenge.

To house files in multiple formats, we used another university platform, Box Drive. Box Drive is a virtual collaborative shared drive much like Google Drive. As files are uploaded to the shared Drive folder, links are generated that allow sharing. A key benefit to housing materials on Box Drive instead of a media library in Cascade is that a "replace file" feature allowed us to update files without breaking shared links on UW's OER. The Box site tells us running administrative usage reports should be fairly easy; however, no one on our program team has permission to run these reports. After several requests and conversations, we are still unsure how to access this usage data.

### *Challenges Related to Reuse*

As writing specialists, we knew it would be important to articulate reuse language on UW's OER documents. In the footer of each page, several important document details are featured: the individual(s) who authored the content, the year and month it was created, contact information for UW, and a hyperlinked [Attribution-NonCommercial-ShareAlike CC License](#). While we can suggest reuse standards in the design of these materials, we cannot control what users ultimately decide to do as they reuse and adapt these resources. There have been several occasions when UW has worked with faculty on campus, faculty at different campuses, and even other program administrators at different campuses, discovering that UW's OER materials are being used and adapted without appropriate attribution. To be clear, we largely assign these instances to our field's history of not recognizing the intellectual, authorly labor involved in developing instructional materials and the commonplace borrowing of assignments and activities that frequently happens among teachers across programs. Likely, those reusing OER materials without following licensing guidelines are not malicious, but they neglect to understand how attributing authorship and following licensing standards can help make OER labor visible and further document the impact an OER is having on the professional field it seeks to support.

### *Supporting Major OER Revisions*

While UW's OER just went live in 2021, we already have our first major revision planned: our university has updated its logo and style guide, meaning our UW template will need to be updated. With the new template, all existing materials will need to be converted. This will create a significant amount of labor as hundreds of files will need to be updated and replaced on the backend of UW's OER. However, we are still optimistic for several reasons. First, the documents meet our accessibility standards, so aside from moving to a new template, content will not need to be retrofitted or redesigned. Second, we have a process in place with instructions, Excel sheets, and training materials for onboarding student workers who will help with this revision. Our considerations for sustainability will make this significant revision more manageable.





## Conclusion

Drawing on UDL to inform our understanding of OER sustainability, we added **accessibility** as a fifth principle, expanding on principles of **labor, cost, usage, and longevity** which have been identified in the literature (Downes, 2007). Accessibility, or the readability of our materials by learners, requires OER developers to seek out information about accessible web and document design and to participate in ongoing trainings to meet current accessibility standards. Although emphasizing accessibility can increase the cost and labor associated with developing an OER, it is well worth it to participate in educational equity and to create a product that benefits more learners. We suggest that OER developers map and document processes for OER labor to create a clear workflow and designation of responsibilities. The cost associated with an OER can be significant, and funding sources should be considered for all stages of the project. OER developers should also consider how they will document and report OER usage to stakeholders to justify associated costs and labor. Finally, a sustainable OER has a lasting lifespan, a goal better achieved when OER maintenance is distributed across team members over time. By considering these five principles throughout the publication and maintenance of the UW OER, we have created a sustainable process that we hope can be adapted and reused by other OER creators.

We conclude with a heuristic that OER creators can utilize as they design a sustainable process for OER publication and maintenance.

## OER Heuristic

### *Accessibility*

- What protocols for accessibility will you establish? How will you document and communicate these protocols to all OER contributors?
- What trainings are required to prepare all OER contributors to enact accessibility standards and practices across their work?

### *Labor*

- What asynchronous processes for updating, adding, or removing resources from the OER will you implement?
- What kinds of process documents will you write and share with OER contributors?
- What kinds of regular trainings on OER processes will you plan and schedule?
- How can you map a project workflow that documents each team member's role, responsibilities, and completion timeline?
- How are the diverse and multicultural backgrounds of team members and users reflected in the OER's content and design?

First, the documents meet our accessibility standards, so aside from moving to a new template, content will not need to be retrofitted or redesigned. Second, we have a process in place with instructions, Excel sheets, and training materials for onboarding student workers who will help with this revision.

*Cost*

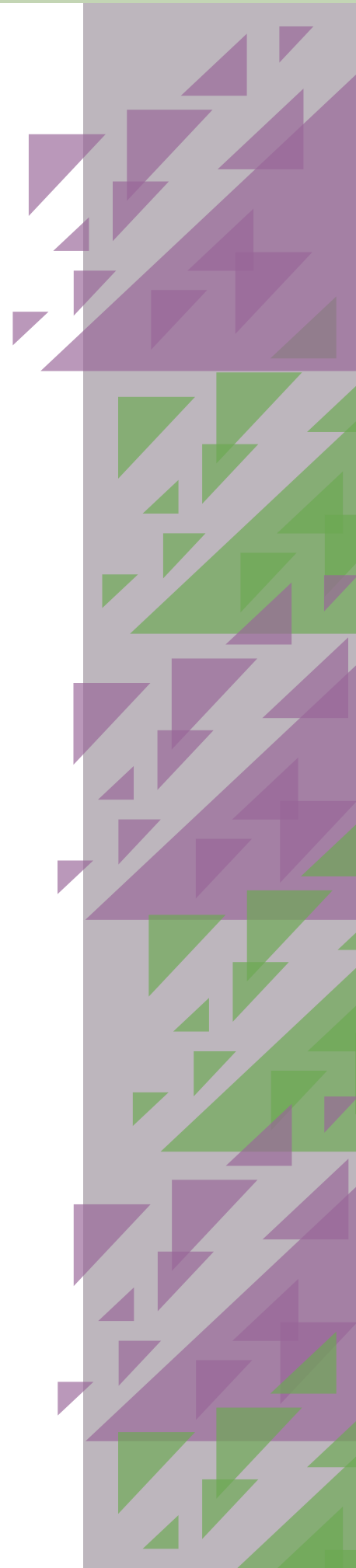
- What is your budget for OER development and maintenance? What is your source of funding?
- How can you negotiate for OER team members' responsibilities to be incorporated into their job descriptions and performance evaluations?

*Usage*

- What kind of usage data should be collected and shared with stakeholders? How can that usage data be obtained?
- When and how frequently will you check whether OER materials function as intended (i.e., materials remain navigable, searchable, and accessible)?

*Longevity*

- What role will each team member assume in ensuring the OER has a sustainable lifespan?
- How will you document and communicate practices and protocols in case of job turnover?



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