From Start-Up to Adolescence: University of Oklahoma's OER Efforts

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In February, 2013, University of Oklahoma (OU) president, David Boren, issued a letter to all OU faculty members highlighting the high cost of textbooks, expressing his strong "support for the move to open access materials in teaching and research," and a charge to carefully "evaluate whether our textbooks and course materials add value to the educational experience equal to their cost to our students." President Boren's letter also announced the imminent hiring of one of the nation's first full-time librarians dedicated solely to open educational resources (OER). Boren recognized, as did many academic administrators, that college affordability was becoming increasingly important to the university's efforts to attract and retain students. The cost of textbooks, in particular, had risen dramatically, and the OU community proved willing to rise to Boren's 2013 charge. This case study describes OU's OER initiatives that arose from President Boren's charge from 2013 to the present—with a specific focus on the Alternative Textbook Grant, which by August 2017 had saved OU students over $1,000,000 in textbook costs.

OER Program Development as a Start-Up Initiative

The University of Oklahoma Libraries senior administration created the position of OER Coordinator in 2013 and is believed to be the first academic institution in the United States to dedicate a full-time librarian solely to OER. The first coordinator was an instructor in the OU School of Library and Information Studies and had a background in the OER movement, having attended the annual Online Learning Consortium/MERLOT (Multimedia Educational Resource for Learning and Online Teaching) conference (Online Learning Consortium, 2017), as

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well as developing a learning object repository as a contractor for a textbook publisher.

This Coordinator developed a plan for the first year, which focused on researching current OER initiatives at other academic libraries and then building awareness of OER on OU's campus. At the time there were only a handful of OER initiatives across the country. Fortunately, they were well documented, and their organizers were willing to share their experiences. These initiatives included those at University of Massachusetts Amherst (Billings, Hutton, Schafer, Schweik, & Sheridan, 2012), Kansas State University (Kansas State University Center for the Advancement of Digital Scholarship, n.d.), and Open Textbook Network at the University of Minnesota (Center for Open Education, n.d.-b). SPARC was just beginning to develop OER as one of their three focus goals (Scholarly Publishing and Academic Resources Coalition [SPARC], 2007), but their support was still critical.

OU's Alternative Textbook Grant program was modeled after the successful initiatives at University of Massachusetts Amherst and Kansas State University, and the University of Oklahoma Libraries (and particularly the OER team) still owe a debt of gratitude to these programs today. These programs, and subsequently University of Oklahoma's program, were built with the goals of:

- supporting faculty in creating open content
- supporting faculty in adopting open content
- creating awareness of open materials on campus.

The OER Coordinator formed an OER Strategic Initiative Planning Committee to formalize the OER initiative in the OU Libraries planning process. This committee of six was comprised of librarians and library staff who defined the first year of initiatives and researched the most expensive and most used textbooks held in the Libraries' textbook reserve program. The committee determined OU Libraries purpose regarding OER would be:

> to support the use of OER and affordable learning solutions (ALS) to reduce student costs. This will include the adoption of OER/ALS by faculty to replace traditionally purchased materials and by students for study support.

The committee further developed the scope of the OER initiative: "This project will focus on piloting sustainable and scalable OER/ALS adoptions on campus. The project will focus on four implementation areas," namely:

- OU Libraries will support the development and use of OER and ALS to replace *textbooks* in the classroom, to save students money, and to give faculty more control over their educational content.
- OU Libraries will support the development and use of OER and ALS to replace *course packs* in the classroom, to save students money, and to give faculty more control over their educational content.
- OU Libraries will work with the University College (University of Oklahoma, 2016) to identify appropriate OER as study aids for students.
- OU Libraries will provide an appropriate platform to support the discovery, creation, reuse, revision, remixing, and redistribution of OER and other affordable learning materials for faculty and students.

The committee also developed corresponding project deliverables and established a timeline of spring 2014–spring 2015 for implementation.

Recognizing the need to support the OER Coordinator's quick-moving start-up effort, OU Libraries hired a student employee to assist the OER Coordinator. The timing was serendipitous; the hired student, an undergraduate electrical engineering major, had made contacts in the library while doing class research on "openness" and Creative Commons licensing. He was interested in technology to support open courseware and through his research had become knowledgeable about open licensing and the open landscape. His technical background, combined with this interest in open education, made him an excellent addition to OU Libraries and the OER effort. From January 2014 through October 2015 the OER team consisted of one full-time equivalent (FTE) (the OER Coordinator) and a 0.5 FTE (the OER Student Assistant) who were solely dedicated to OER.

One of the first identified issues was a lack of knowledge about open content on the OU campus. The OER Coordinator created connections on campus to increase awareness of the rising cost of educational materials, as well as present possible solutions using both openly licensed content and materials licensed through OU Libraries. Fortunately, the use of openly licensed content was beginning to take hold in several key

strategic areas across the university: the Dean of OU's College of Arts and Sciences had recently adopted the open textbook *Introduction to Sociology* (Griffiths et al., 2015); OU's Center for Teaching Excellence (CTE) was working on a MOOC (massive open online course) platform, Janux (NextThought, 2017), and was encouraging the development and use of openly licensed materials; and the University of Oklahoma Regents had joined MERLOT as a Higher Education Partner (MERLOT, California State University, 1997) with a faculty member from OU's Department of Physics and Astronomy serving as the Project Director/Partner Liaison. Yet these were isolated uses of OER, and there was otherwise a lack of knowledge among the general faculty, including the library faculty, on OER and its related components: Creative Commons licensing, finding and evaluating OER, and "open" as a concept.

Believing that faculty members listen and learn from their colleagues, the OER Coordinator first began her awareness efforts by enlisting three faculty members who were already familiar with open textbooks to give a panel presentation at OU's annual Teaching Scholars Initiative in fall 2013, less than a month after she was hired. She also quickly partnered with OU's CTE to design and distribute a survey to all faculty members with the goal of identifying those who had been using open materials or who were interested in knowing more about reducing the cost of materials for teaching and learning. Additionally, she continued to partner with staff at CTE to support Janux (NextThought, 2017), by finding open materials for faculty planning to teach in the platform. When the Janux platform launched, many of the courses were taught using fully open materials that had been curated by CTE and the OER Coordinator.

During fall 2013, the OER Coordinator also began to build awareness among librarian faculty by working with the subject specialist librarians in group and individual instruction sessions covering Creative Commons licensing and the OER movement. During these sessions, each participating librarian was given a matrix of large OER repositories such as MERLOT (MERLOT, California State University, n.d.), OpenStax CNX platform (OpenStax, n.d.), OER Commons (Institute for the Study of Knowledge Management in Education [ISKME], 2007), and the Open Textbook Library (Center for Open Education, n.d.-a). In some cases, more specialized repositories, such as ComPADRE (ComPADRE Digital

Library, 2003) and the Noba Collection (Diener Education Fund, 2017) were provided. Librarians then filled out the matrix by evaluating the quality and coverage of their corresponding disciplinary resources in these OER repositories. This exercise achieved two goals: it enabled librarians to become more familiar with OER repositories and the specific disciplinary resources held in each, and it provided the seeds for building an OER-focused LibGuide to assist faculty and librarians in their selection of OER and alternative course materials.

In anticipation of the soon-to-be-introduced Alternative Textbook Grant, the OER Coordinator developed the OU Libraries OER LibGuide (Taylor, Waller, Zemke, & Biamah, 2017) and an accompanying blog (Taylor & Zemke, n.d.) with the goal of making it easier for interested faculty to find open textbooks and OER by subject and disciplinary area. The blog was used to document OER-related matters, such as detailing the LibGuide development process, recording searches and search strategies for OER, publishing liaison librarian reviews of OER repositories, and posting interviews with OU faculty members currently using an open solution for their courses. The latter strategy, specifically, was a popular and engaging format in which to share faculty members' experiences and illustrate the many achievable (and easy) ways to use open content. The blog also gave the OER Coordinator an opportunity to grow OU Libraries' OER program by further supporting the activities of these faculty members.

Additional outreach efforts during this early phase of the initiative included events held during Open Education Week (Open Education Consortium, n.d.):

- A "Waffles for Writers" event, which connected faculty with OER and OU's Writing Center
- Tabling events designed to raise student awareness of OER
- A Wikipedia Edit-a-Thon to improve Wikipedia content about women in the history of science. This event was a particular success, because of partnerships already established with the Writing Center and a faculty member in the Department of History of Science who provided extra credit to participating students.

Establishing the Alternative Textbook Grant

In spring 2014, the OER Coordinator introduced the Alternative Textbook Grant at OU's annual Academic Tech Expo. The primary purpose of the grant program was taken directly from the OER Strategic Initiative Planning Committee—*to reduce student costs*. The initial grant program was extremely flexible, and the OER Coordinator was willing to support projects as long as they saved students money. This included the use of OER and library-licensed materials such as databases, ebooks, and collections of items placed on reserve. The OER Coordinator relied heavily on personal relationships to recruit applicants, and she continued to reach out to those faculty members who had already indicated interest in using OER. For example, some of the recruitment targets had responded to the Center for Teaching Excellence survey that had been distributed in the fall; some had attended OER events; some were already active library users, and others had been involved in OU's Teaching Scholars Initiative. These faculty members were thought to be most interested in new approaches to teaching and learning, so it was thought they might also be most interested in transitioning from traditional course materials to OER.

The Alternative Textbook Grant was designed to support faculty members in finding and creating alternative course materials for their classes. The amounts awarded in this pilot phase were between $1,200 and $2,500 and were designed to compensate instructors for the time and effort it took to find, adopt, modify, or create new resources as well as time and effort required to create accompanying slide decks, tests, quizzes, handouts, and other ancillary materials. The initial cohort of grantees consisted of five faculty members who were awarded a total of $9,600. They projected that for one semester a total of 420 students would be impacted, saving those students $57,975 in displaced textbook costs. In actuality, $59,842 was saved the first semester of implementation. The terms of the grant required the alternative resource be used for two semesters (the semesters did not necessarily have to be sequential, acknowledging that not all courses are taught every semester), and the projected savings for two semesters for the initial $9,600 "investment" was nearly $116,000.

The Not-So-Terrible Twos

During the second year of the initiative, the OER team continued an awareness campaign—now about OER in general and the Alternative Textbook Grant specifically—and continued to look for additional strategies to save students money. The first year's outreach had focused on "likely candidates" and "low-hanging fruit," but it was now time to recruit instructors who may have never heard of OER.

Therefore, a key component of building awareness in the program's second-year initiative was to *go to* the faculty members, instead of relying on personal contacts. One successful outreach strategy was to meet individually with faculty members, in their office, as a traditional publisher's textbook representative might. Instead of representing a traditional publisher, the OER team members became the "Open Textbook Representatives." Prior to these meetings, the OER team would research existing open textbooks and other OER that were applicable to the discipline and the class taught by the faculty member with whom they were about to meet. They would then go to the faculty members' offices with a curated list of sources and perhaps a complimentary coffee.

The OER Coordinator, where possible, attended faculty meetings to discuss OER—even if it was for only five minutes. Developing, practicing, and memorizing an "elevator pitch" targeted to every campus constituency (faculty, administrators, students, etc.) in as many disciplines as possible became important to this effort, because it was often necessary to quickly relay the benefits of OER and open initiatives in very short conversations.

Staff in the OU Libraries Circulation Department were already receiving a textbook list from the university bookstore in order to purchase copies of highly used textbooks to place on reserve, a strategy that certainly saved students money. The OER team began using this textbook list for an additional purpose—identifying the top 30 courses requiring the most expensive textbooks. This exercise prepared the team for focused faculty recruiting in the classes that would demonstrate the highest cost savings for students if the expensive textbooks were replaced with OER. The textbook list also allowed the OER Coordinator to glean additional insight about assigned texts. For example, she could now easily determine which classes were using a traditional textbook authored by an OU faculty member or which classes were using "custom" books assembled by pub-

lishers. The OER team chose to forgo outreach to these faculty members, for these would perhaps be more difficult conversations with higher barriers. Instead, the OER team used the textbook list to focus on faculty members who were assigning expensive texts but who would likely have fewer objections and obstacles.

Additionally, the OER team identified the most expensive course packs (collections of articles printed and bound at a local copy shop), and analyzed them to determine if they included materials that were available through library databases. While other academic institutions may have had success with this strategy, the second-year OER team did not. Many of the articles were not available through OU Libraries subscriptions. Additionally, the resources necessary to disentangle associated copyright issues prevented the team from exploring this idea more fully until 2017 when OU Libraries purchased a subscription to Leganto powered by Proquest SIPX, formerly Stanford Intellectual Property Exchange (Ex Libris Ltd., 2017).

In the initiative's second year, the OER Coordinator made the decision to partner with two existing organizations and, along with a handful of other academic institutions, became early partners with OpenStax (Rice University, 1999) and the Open Textbook Network (Center for Open Education, n.d.-b). Membership in these two organizations provided OU's OER initiatives with the additional support and resources necessary to grow the OER program. For example, OpenStax provided a textbook rack and physical copies of several of their then-current textbooks. The OER Coordinator used this rolling display rack at outreach events as a way to increase awareness among students and as a way to demonstrate the quality of open textbooks. Using the OpenStax books in this way also clearly demonstrated that open textbooks were available in a physical format should students desire to purchase them.

The Open Textbook Network's initial support included an on-site workshop, which at the time was a half-day learning opportunity for faculty members and librarians. Staff from the Open Textbook Network presented the background and context for open textbooks, and they provided the structure and incentives for OU faculty members to review open textbooks on the Open Textbook Library platform. This activity was extremely successful. By allowing faculty members to judge the quality of open textbooks themselves, they confronted one of their preconceptions—that open

textbooks were not rigorous enough for their classes. Of the 18 faculty members who attended the workshop and wrote reviews, 14 have gone on to adopt, modify, or create an open textbook for use in their classes.

The second year also brought the beginning of two important partnerships that continue today. As previously mentioned, OU's Dean of the College of Arts and Sciences (CAS) had already adopted the OpenStax book *Introduction to Sociology* (Griffiths et al., 2015) for his sociology classes, which had approximately 300 students per semester. Using the book over a number of semesters gave him the opportunity to compare the open textbook to the traditional textbook he had previously used, to learn how students used the open resource, and to determine if the open textbook provided the same or better learning outcomes for his classes (The University of Oklahoma, 2014). His experience and his students' experiences were positive, so he was sold on using OER in classes where it was possible. As the Dean of CAS, he could help advocate for the use of OER among CAS chairs, directors, and individual faculty members. Even better, he became the first dean at OU to provide matching grants for CAS faculty members who received an OU Libraries Alternative Textbook Grant. Doubling the amount of money available to grantees helped motivate CAS faculty members to apply for these grants. In the third year of the grant program, OU's Price College of Business joined in the partnership by contributing matching funds as well. Since 2015, the Alternative Textbook Grant program has had funds contributed from CAS, OU's Business College, or both.

The second year of the OER initiatives also saw a rise in the outreach and support the OER Coordinator gave to using Wikipedia in the classroom. Wikipedia allows students to contribute in a way that helps further worldwide knowledge, instead of writing a term paper or capstone paper that gets graded and sits on a shelf (or worse). Wikipedia for Education's tag line is, "The end of throwaway assignments and the beginning of real-world impact for student editors" ("Wikipedia," 2017), and Wikipedia has enhanced their educational resources and tools, making it much easier for faculty members and students to participate in a Wikipedia-guided and structured course. Supporting faculty members on Wikipedia projects had the added benefit of engaging subject specialist librarians in OER projects, which until then had been relatively challenging.

The second year of the Alternative Textbook Grant saw an increase in faculty grantees over the first year, with 17 participating faculty saving students $274,000 in the first semester alone.

OER Initiative and the Evolution of Understanding the Technology

When OU Libraries began its pursuit of increasing the use of OER on campus, there was always a question about the form in which OER should be delivered. Initially, most of the OER used on campus were created by a faculty member at another university, which, for delivery at OU, meant distributing open textbooks as PDFs. Yet from the first year of the program, OU faculty pushed the bounds of available OER formats.

In the first year of the Alternative Textbook Grant, one of the grantees—a faculty member in OU's College of Engineering (now Gallogly College of Engineering)—used his grant to continue developing a platform he had created for his undergraduate engineering classes. This web-based platform, *OU Engineering Media Lab eCourses* (Gramoll, n.d.), contained resources on thermodynamics, statics, dynamics, solid mechanics, and calculus. Through this platform he also delivered exams to his students—students entered their responses into a web form using specially configured tablet computers. This grantee used funds from his Alternative Textbook Grant to purchase additional tablet computers necessary to deliver these resources. Also as a condition of his award, the grantee faculty member added a previously absent Creative Commons license to the eCourses site.

Also in the first year of the Alternative Textbook Grant, another engineering professor was awarded funds to implement an open textbook in her thermodynamics class. She chose to modify existing thermodynamics content available under a Creative Commons license. Instead of delivering the content as a PDF, she wanted to host the content on a website of her own so that she could make immediate changes to it as she presented to her students. She used her Alternative Textbook Grant to hire an exceptional student who had recently taken her thermodynamics class: this student helped her edit the content of the openly licensed thermodynamics books so that it would better fit her class. Because the original text had been published on the web, it was copied as HTML, and it was in this format

that her student did the content editing. Many faculty members may have an aesthetic in mind for their website; however, they often do not possess the know-how to create such a site. This case was no different. Neither the faculty member, the thermodynamics student, the OER Coordinator, nor the OER Student Assistant had solid experience building the website envisioned by this engineering faculty member. The OER Student Assistant set out learning how to do so, and built an adequate website that served the faculty member's needs and her students' needs. Even though the resulting website was not aesthetically appealing or responsive to mobile devices, the exercise taught two important lessons about OER delivery: 1) how to properly display equations on the web, and 2) creating websites from scratch to host open content was not sustainable.

Realizing that mobile responsiveness would be key to future OER projects, the OER Student Assistant began to learn about responsive frameworks and eventually applied Bootstrap, a popular responsive framework, to the second iteration of the open thermodynamics book. Though this made the content easier to read on mobile devices, implementing it on websites built from scratch required far more individual attention than could be given to a single project with the available resources. This proved to be problematic if OU's OER efforts were to scale as hoped.

Also in the first year of the Alternative Textbook Grant, a faculty member in OU's Department of Chemistry and Biochemistry received an award to make his biochemical methods lab manual more accessible. Prior to receiving a grant, he had hired a graduate student to create the lab manual, which was created using iBooks Author. This yielded an attractive result, but such a solution made it only accessible to students who owned Apple devices. Other students who were required to use the lab manual had to borrow an Apple device from the Libraries or print the content using an Apple computer. Those involved in the project determined that transforming the lab manual into a website would make it far more accessible. Because a Bootstrap layout had already been built for the thermodynamics book, it was decided to "simply" insert the lab manual content into that same framework. Although the process was easier the second time around, it was still too labor-intensive to continue providing this service with the available resources; yet, it was too complex a process to ask the grantees to do it themselves given the technical skills required.

Not long after building these sites, the OER team discovered *The American Yawp*, a "free and online, collaboratively built, open American history textbook designed for college-level history courses" ("The American Yawp," n.d.). The OER team was inspired by its appearance and interface. Until this point, they had only known WordPress to be used for creating blogs, but *The American Yawp* definitely did not take the same form as a blog. This led to an investigation of WordPress as a publishing platform for OER. Applying what was learned from the previous two projects, the OER Student Assistant made use of a MathJax plugin (MathJax Consortium, 2009) for rendering equations from LaTeX markup and applied a mobile responsive theme to a WordPress instance. Given its promise, this approach was recommended as the preferred and supported solution for the next Alternative Textbook Grant cycle.

During the second grant cycle, a faculty member in OU's Department of Biology was the first grantee to use WordPress as a publishing platform. While he worked on authoring his biology textbook in WordPress, the OER team continued experimenting with WordPress by converting the previous year's thermodynamics content and the biochemical methods lab manual into their own WordPress site. These three individual WordPress sites were maintained by a single WordPress multi-site instance managed by the OER team.

Using WordPress as an OER publishing tool put the OER team one step closer to an ideal solution. It allowed them to publish equations to the web in an easy way—a feature that has become a litmus test for determining if a publishing solution is worth pursuing. Publishing with WordPress also allowed them to create their own OU OER-branded, mobile-friendly theme and apply it to all the works they produced. Despite these features, it became apparent after one year's worth of effort that WordPress might not be an ideal solution after all. Clearly it was better than building websites from scratch, but modifying WordPress themes was difficult, and some of the relied-upon plug-ins did not work well together. Any change they wanted to make to a theme required wrestling with "child-themes" and large stylesheets. More importantly, using WordPress this way made the OER team the gatekeeper of content hosted on the multi-site WordPress instance. Even though grantee authors were given login information and all reasonable privileges to their

respective sites, authors would still contact the OER team regarding issues such as adding contributing authors. While this problem sounds like a very small one (and it was), the OER team did not want authors to depend on them to access or otherwise manage their content. They felt strongly that continuing to operate in such a way was antithetical to the principles of OER and the 5R Permissions (Wiley, n.d.).

During the search for a better way to author and publish OER, the OER Student Assistant learned about a widely used authoring and publishing tool, Pressbooks ("Pressbooks for EDU & Open Textbooks," 2017). Because he was already experimenting with WordPress, investigating Pressbooks was a natural next step—Pressbooks is a WordPress-based publishing platform featuring the option to export its contents as a number of different file types. Its ability to export content in this way was attractive and would theoretically make content available and accessible to as many people as possible, technically speaking. The OER team believed Pressbooks might answer the question they had been asking themselves, "What format will we officially support for OU-generated OER?" With Pressbooks they believed they could support them all! The OER team installed an instance of Pressbooks and began running tests and evaluating the platform, including the litmus test mentioned earlier, "How well does it handle equations?" Because they had encountered math-heavy projects early in the OER initiative, they were attuned to the challenges equations pose and considered it good fortune to have faced these challenges so early. Aspirationally, they sought to incorporate the beauty and functionality of the equations in *The Feynman Lectures on Physics* (Feynman, Gottlieb, & Pfeiffer, 1963) to the projects on which they worked. Simply put, Pressbooks does not support the inclusion of equations in all of its output formats. Because the seamless inclusion of equations is foundational to OER, this did not bode well for the continued use of Pressbooks.

Aside from its difficulty displaying equations, Pressbooks operates differently than other WordPress plug-ins. For one, Pressbooks completely "takes over" the familiar WordPress interface. This, in and of itself, was not a problem; instead the OER team was more concerned with the difficulty this posed for our desire to modify its *front-end* interface. In particular, OU's OER team did not appreciate the skeuo-

morphism apparent in Pressbooks' front-end interface. There is little reason to force a web browser to behave like a book and appear "book-like" to a reader. This, in combination with its clumsy way of displaying equations and its too-imperfect pagination in other export formats, closed the team's investigation into Pressbooks as a publishing platform—at least for the time being.

Having determined that Pressbooks was not the right platform and still not entirely pleased with scaling WordPress implementations, the OER team continued its pursuit of a better publishing workflow and next explored Markdown (Gruber, n.d.), a simple markup language often used in conjunction with a tool called pandoc ("Pandoc - About pandoc," n.d.). Intended to be both easily read and easily written, Markdown's syntax corresponds to the most common HTML tags making its syntax concise and easy to learn. When composing documents in Markdown, the content is by nature separated from the styling. In contrast, programs such as Microsoft Word require that authors compose and style documents simultaneously. Separating content from style allows content to exist independently of any output format, which is well suited for OER. Again, publishing OER in as many formats as possible is what OU's OER team strives for. By composing their works in Markdown, OU's faculty authors are, in essence, composing structured data that can then be made to take the form of a website, a PDF, an epub, and many other formats.

Even better, Markdown is easy to edit. Markdown files are flat, plain text files which means they can be opened and edited in any text editor, many of which are freely available. This is in contrast to open textbooks distributed as PDFs, which can be difficult to modify. Because Markdown can be converted to a variety of formats, it can be thought of as the "universal source code of open textbooks"—as long as an open textbook's Markdown files are available, anyone has the ability to very easily edit the textbook. Using Markdown to author OER allows the OER team and their grantees to stay true to the fundamental to the tenets of OER, the 5R Permissions (Wiley, n.d.).

Though it is easy enough to read during the authoring process, Markdown is a markup syntax, so it is not intended to be read by end users. In order to put Markdown into a more fitting form for readers it needs to be converted. The open source conversion tool, pandoc, is

one of the most useful and extensible tools for converting Markdown to more useful formats. Pandoc can convert and export Markdown to all the same file formats that Pressbooks can—HTML, epub, mobi, DOCX, and PDF. A drawback of pandoc is that it must be used via the command line. This nearly made the OER team forgo using Markdown, as they knew their grantees would, in most cases, be unwilling to jump over this additional hurdle. Encouraging them to learn Markdown seemed daunting enough; requiring them to use the command line seemed insurmountable.

Instead, in order to make writing Markdown as easy as possible the team set out to create a better way for grantee authors to access and use pandoc. In late 2016, the OER team built what is currently called the *Markdown Converter* (Taylor, n.d.), a web interface to pandoc packaged with additional tools and style sheets that make it ideal for quickly and easily producing a variety of outputs from one uploaded folder. Authors upload a zipped folder—containing the Markdown flat files along with accompanying image files to be used in the open textbook—to the web-based Markdown Converter, choose one or more output formats, and select and preview a style sheet. The Markdown Converter then quickly produces the properly formatted result in as many output formats as selected. The OER team is piloting the use of the Markdown Converter with instructors who received an Alternative Textbook Grant in the 2017 cycle for the 2017–18 academic year.

Operationalizing the OER Initiative: Into Adolescence

The 2015–16 academic year brought changes to OU's OER initiatives. In October, the OER Coordinator decided to pursue another job opportunity. Because the OER program had now developed some legs of its own, and because of changes to other OU librarians' job responsibilities, the OER Coordinator position description was revised to encompass both OER responsibilities and Scholarly Communication responsibilities—a change that more closely aligned the role with similar job responsibilities across the country. The new position, now called "Open Educational Resources and Scholarly Communication Coordinator," was split 70 percent OER and 30 percent Scholarly Communication and was posted in early November 2015, around the same time the original OER Coordina-

tor left. A new OER Coordinator was hired in March but was not able to begin working until late May 2016. This is especially remarkable because during these seven months between November and June, the OER program was run nearly entirely by the 0.5 FTE OER Student Assistant with support from the Associate Dean for Scholarly Resources and Services. While this undoubtedly slowed the program's forward momentum a bit, the OER Student Assistant did an outstanding job of keeping the Alternative Textbook Grant program running. In April 2016 OU Libraries awarded grants to 17 faculty members for 19 different OER projects. In early June, the program "restarted" with the new OER Coordinator and, by this time, the OER Student Assistant had proved to be such a valuable asset to the organization that he was hired full-time as one of OU Libraries Emerging Technologies Librarian, devoting 30 percent of his time to OER projects.

The first order of business for the new OER Coordinator was to personally meet with all 17 grantees in order to better understand their projects, their personalities, and the support the Libraries could provide to them. These meetings primarily took place during summer 2016. At the same time, she began working on providing more structure to the Alternative Textbook Grant. The program had done very well up to this point, but much of the grant program's expansion had taken place organically and without clear guidelines. The new OER Coordinator wanted to bring more standardization to the program, while still allowing it to be flexible enough to accommodate as many projects as possible. This included establishing a tiered service model that outlined the services the OER team and subject specialist librarians would provide based on the type of OER project undertaken by each grantee.

Formalizing the Alternative Textbook Grant

The OER team had always kept track of their grantee's projects, and the new OER Coordinator determined these projects most often fell into four general categories:

- *Library resources*: Those who used library resources to replace their existing, traditional textbook, often assembling a reading list or using an ebook with a multi-user license from OU Libraries collection.
- *Adoption*: Those who replaced their existing, traditional textbook by

adopting an existing open resource and using it as is, or using significant portions of it and requiring minimal editorial changes.
- *Modification*: Sometimes called "adaption" or "adaptation," this category included grantees who made more significant editorial changes to an openly licensed resource. This sometimes included combining chapters from several different sources or adding a small amount of original content to an existing open resource so that it was tailored to their particular class.
- *Creation*: Those who created an original resource from scratch, which sometimes included heavily modifying content from an already existing open resource.

The OER team decided to formalize these categories, with the understanding that some grantees may fall into more than one category. They then determined the suite of services that they could provide for grantees at each of the four levels. This enabled support services to be more focused, instead of attempting to support every project possible. It also provided clear guidelines and expectations for the grantees. Of course, grantees have the freedom to pursue whatever alternative textbook solution they prefer; however, the OER team could no longer guarantee that they could support any and every solution.

The services the OER team provided at each level acknowledged the range of efforts in transitioning from a traditional textbook to an alternative solution and were as follows:

Table 1. Services Offered by the OU OER Team

Library Provides	**Category 1: Library Resources**	**Category 2: Adoption**	**Category 3: Modification**	**Category 4: Creation**
Funding ($250–$2500)	X	X	X	X
Orientation workshop	X	X	X	X

Library Provides	**Category 1: Library Resources**	**Category 2: Adoption**	**Category 3: Modification**	**Category 4: Creation**
Creative Commons license support		X	X	X
Print-on-demand services		X	X	X
Copyright clearance assistance			X	X
Stable repository platform		X	X	X
Assistance modifying existing OER			X	X
Workflow for authoring and publishing				X
Cover design				X
Assigning a DOI			X	X
Assigning an ISBN				X
Services of a project manager			X	X
Services of a subject specialist librarian	X	X	X	X

The formalized service model also explicitly stated the terms to which the grantees would agree. While the original OER Coordinator had always required grantees to sign a memorandum of understanding (MOU), those terms were not always clear to faculty members before they received a grant. Beginning in 2017, recipients of the Alternative Textbook Grant agreed to the following:

Table 2. Terms Agreed to by Grantees

	Type of Textbook Replacement			
Grantee Agrees To	**Category 1: Library Resources**	**Category 2: Adoption**	**Category 3: Modification**	**Category 4: Creation**
Provide access to student feedback	X	X	X	X
Share experiences willingly	X	X	X	X
Attend an orientation workshop	X	X	X	X
Follow the terms of license on adopted materials		X	X	X
Apply a Creative Commons license of your choosing to the work			X	X
Upload to SHAREOK		X	X	X
Use the Libraries' publishing/ authoring workflow				X

To make these categories and services clear to potential grantees, the OER team revised the existing grant application and moved it from a Qualtrics-based survey to a Google Form for ease and access. The new application linked to a LibGuide (Waller, Taylor, & Biamah, n.d.) that detailed the new service model, and it asked participants to place themselves in at least one category. The revised application form requested, among other details, information about the applicant, the course, the resource being replaced, and the process by which the applicant intended to assess the effectiveness of the OER used.

Creating a formalized service model and asking grantees to place themselves into a category, combined with the updated grant application, also provided the OER team with an additional way to evaluate grant proposals. For the first several years of the program when fewer faculty members applied for grants, it was relatively easy to contact each applicant and discuss their project well before the submission deadline. Additionally, many of the previous grantees had come from personal connections. As the number of grant applications grew, it became more challenging to reach out to each applicant individually. This was also a partial drawback of the new grant application as a Google Form—when the grant application was in Qualtrics, the OER team was able to see who had started an application and how far along they were in the process. With the move to Google Forms, this was no longer possible. Therefore, the additional, clarifying questions on the grant application allowed the OER team to better understand applicants' projects, even when we had not heard about them prior to evaluating the application.

With a more formalized program in place, the OER Coordinator began a concerted marketing and outreach campaign. The 2017 grant cycle kicked off with a panel presentation at the Academic Tech Expo where the OER Coordinator moderated a session that included three previous grantees and the Emerging Technologies Librarian working on OER. This was the start of many presentations over the next several months while the grant application was open—presentations in faculty and departmental meetings, Deans and Directors meetings, Executive Committees of Colleges, and for other university committees. Each presentation was similar, but each slide deck was individually tailored for the particular audience. For example, the OER Coordinator used images specific to the

audience, such as a photos of a department's home building when presenting to faculty in a departmental meeting. Further, each slide deck always contained general information about textbook costs, but they also contained costs specific to the textbooks used in the particular academic department.

General "drop-in" information sessions were also scheduled between the time the grant application opened and when it was due. These sessions were held at least once per week until a month prior to the grant due date; in that last month, they were held between two and four times per week. Drop-in sessions were held in the main OU library, branch libraries, and in departmental conference or meeting rooms across campus. The OER Coordinator worked with the subject specialist librarians to schedule the departmental sessions. None of the sessions drew large attendance, but most sessions drew enough interest to warrant continuing them, and all sessions resulted in making a personal contact with someone interested in OER and/or the Alternative Textbook Grant.

The Alternative Textbook Grant was advertised on a rotating header on the home page of OU Libraries website, in addition to digital signage throughout OU Libraries, especially in high-traffic areas. The OER Coordinator crafted emails that subject specialist librarians could send to their faculty members, either in whole or in part, and she ensured that subject specialist librarians had the tools they needed to advocate and promote the Alternative Textbook Grant. Information about the grant, including dates for the drop-in sessions, was also posted in OU Libraries monthly faculty newsletter and the OU Provost's weekly newsletter. The drop-in events were advertised on the OU Libraries website as well, and the OU Libraries Communication Coordinator used social media, primarily Twitter and Facebook, to further spread the word across campus.

One of the most successful outreach strategies was a direct email campaign, which consisted of three different target groups: 1) faculty members who taught classes that mapped closely with existing OpenStax textbooks, 2) faculty members who taught classes with the most expensive textbooks, and 3) faculty members who taught classes where transitioning to an open textbook would make a high financial impact—classes containing a large number of students combined with a relatively expensive textbook. Each email was tailored to a specific faculty member, addressing

them by name and explicitly referring to the textbook they used. These three campaigns, sent over a period of three weeks, generated grant applicants, and—more importantly—generated an increased dialog between faculty members and the OER Coordinator. Faculty members were willing to discuss their thoughts and opinions about OER, which often gave the OER Coordinator an opportunity to provide accurate information and to clear up misconceptions about open content. Creating, tailoring, sending, and responding to these direct emails was time-consuming, but well worth it for the increased dialog and applicants that resulted from this tactic.

Grant applications were reviewed by the OER team, which consisted of the OER Coordinator, the Emerging Technologies Librarian working on OER, and a new OER Student Assistant, hired in January 2017. The Associate Dean for Scholarly Resources and Services also served as a final reviewer. In an effort to formalize the evaluation process, the OER team developed a rubric, which was later abandoned. The OER team determined that since the grant applicants hadn't seen the rubric prior to applying, it would not be fair to apply it to judge their submissions. Therefore, applications were reviewed, and grants were awarded based on:

- The potential for student savings, which was the product of the projected class enrollment and the cost of existing materials. OU's OER team calls this "impact," and higher impact classes receive more funding.
- The frequency of course offering, with more frequently taught courses receiving higher funding.
- The overall impact of the project on open education. For example, an applicant creating an OER, especially one where there was an existing gap in openly available material, received higher funding than an applicant using library-licensed resources.
- Scheduling: the course had to be scheduled for summer 2017, fall 2017, or spring 2018. Courses that occurred later than spring 2018 would be placed on the next grant cycle.
- Adoption date: with some exceptions, course material had to be created and/or adopted over the summer and fall of 2017.
- Applicants' agreement to the terms in the support/agreement chart.

Grants, including any matching or contributed funds from other colleges, are paid in two installments; the first half of the grant is paid in the summer, and the second half of the grant is paid in the fall. Members of the OER team work closely with each grantee throughout the year to ensure they are making good progress on their grant projects.

OU Libraries places no restrictions on how grant funds are spent. Examples of how previous grantees have spent their funds include: supplemental income, funding a student to help create open resources, purchasing technology to be used in the classroom, and airfare and lodging for colleagues to travel and collaborate on creating alternative resources.

The 2017–18 grant cycle was the largest grant cohort, with 18 grantees representing 19 different projects across five colleges. With this grantee cohort, OU has cumulatively saved their students $1,631,935 throughout the four-year existence of the Alternative Textbook Grant program.

Growth Toward Adulthood: Next Steps

The OER team at OU has much to celebrate, especially the $1,000,000 milestone. But the celebration will be short-lived as the team looks toward future growth of the program. Some of these plans include:

- *Formation of an OER Action Committee*: the original OER Strategic Initiative Planning Committee was an internal library group, and it disbanded after delivering on its original goals. Recognizing the need for additional collaboration, the OER team, with support from the Dean of Libraries, has formed an " OER Action Committee" comprised of stakeholders across the university. These committee members include representatives from the Center for Teaching Excellence, the College of Liberal Studies (which houses OU's online degree programs), the Provost's Office, the Disability Resource Center, Information Technology, the Office of Academic Assessment, the OU Bookstore, and OU Press. Additionally, the committee will have a faculty member representing STEM disciplines (science, technology, engineering, and math), a faculty member from the University Libraries Committee, a faculty member from social sciences or humanities, and undergraduate and graduate representatives from Associated Student Government. The OER Action Committee is charged with promoting the aware-

ness, reach, and uptake of OER at OU and will begin meeting in fall 2017.

- *Enhancing access to OER used at OU*: The Alternative Textbook Grant program has enabled the use and creation of a great number of OER, and these resources have clearly saved OU students money. The OER team has stayed busy keeping OER initiatives running and enhancing its existing programs, which has meant it has been challenging to make OU-authored works available to learners across the globe. Too often grantees use their OER in the learning management system, but it is not shared more broadly. One of the OER team's highest priorities is to provide better access to these works through a dedicated collection in OU's institutional repository, SHAREOK.
- *Better promotion of our textbook on reserve program and ebook collections as alternative textbook solutions*: Purchasing hardcopy textbooks of the most popular classes and placing them on reserve is neither a sustainable nor sought-after solution, yet it still helps save money for students. Unfortunately, not enough students are aware that they can check out textbooks on reserve at the Libraries. Additionally, like many, OU librarians are purchasing more ebooks. When licensing terms allow, the OER team would like to better market these ebooks to faculty members as low/no-cost solutions for OU students. While neither of these solutions fit the strict definition of OER, they do help lower the amount students spend on their education.
- *Refining Markdown authoring/publishing workflow*: As the 2017–18 academic year is the pilot year for using Markdown for authoring and publishing, the OER team will be making adjustments and enhancements to the Markdown Converter and the ways in which they assist faculty members in its use.

In addition to these actionable items, the OER team has also been thinking more philosophically about how it supports and advocates for OER in the future. For example, the Alternative Textbook Grant gives preference to authors who create original OER. These are the grantees who, generally, receive the most money and support. But perhaps it would be wiser to prioritize the adoption of already existing OER, which requires less time and energy on everyone's part. Additionally, the team has begun to rethink the

term "ROI" and how administration views a "return" on the amount of money used for Alternative Textbook Grants. A "return" on OER is best analyzed over the long term, instead of on a semester or even yearly basis, for they cumulatively build over semesters of use, which for OU's OER team is an apt metaphor for the value of OER in general.

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Appendix A: OER Initiative Scope

This project will focus on piloting sustainable and scalable OER/ALS adoptions on campus. The project will focus on four implementation areas:

- OU Libraries will support the development and use of OER and ALS to replace *textbooks* in the classroom, to save students money, and to give faculty more control over their educational content.
- OU Libraries will support the development and use of OER and ALS to replace *course packs* in the classroom, to save students money, and to give faculty more control over their educational content.
- OU Libraries will work with the University College (University of Oklahoma, 2016) to identify appropriate OER as study aids for students.
- OU Libraries will provide an appropriate platform to support the discovery, creation, reuse, revision, remixing, and redistribution of OER and other affordable learning materials for faculty and students.

Appendix B: OER Repository Evaluation Exercise

Site being evaluated:
Subject area evaluated:
General Questions:

1. Who are the main content authors and what are their affiliations/qualifications?
2. Who are the reviewers/curators for this site?
3. Is the site content actively updated?
4. What audience(s) is the content designed for (select all that apply)
    1. K-12
    2. Lower division undergrad
    3. Upper division undergrad
    4. Graduate
5. How easy is it to navigate and find resources on this site?
    1. Very easy
    2. Somewhat easy
    3. Easy
    4. Difficult
    5. Very difficult
6. Are the materials represented:
    1. Primary sources (images, graphs, drawings, recordings with little educational content)
    2. Secondary sources (instructor created lectures, presentations, videos, audio)
    3. Both
7. What types of media are represented on the site (select all that apply)
    1. Text
    2. Video
    3. Audio
    4. Simulations/interactive
    5. Textbooks
    6. Links to other web pages

8. Content can be exported from this site as (select all that apply)
    1. HTML files
    2. PDF files
    3. EPUB2 files
    4. EPUB3 files
    5. Can only link to content; cannot export
9. Use restrictions for content on this site:
    1. CC licensing
    2. Fair use
    3. Copyrighted to the owner (but content can be linked to for educational use)
    4. Varies by individual item
10. This collection is strongest in (select all that apply)
    1. Complete courses
    2. Textbooks
    3. Individual lessons
    4. Audio/visual
    5. Simulations
11. Site recommended for subject area?
    1. Yes (why?)
    2. No (why not?)
12. General comments or suggestions for using this site and content area by faculty.

Appendix C: Alternative Textbook Grant Application Questions

- **Basic Information**
    - Name
    - Email address
    - Position/rank
    - College
    - Department
- **Course information**
    - Class prefix and number (e.g. MATH1113)
    - Title of the class

    - Catalog description
    - First semester your alternative textbook solution will be implemented
    - Number of sections you will be teaching
    - Number of sections of the course taught by others
        - Will any of them be using this textbook alternative?
        - If so, please include these instructors' names
    - Is the course taught every semester?
    - Course enrollment – maximum and expected
    - Is this a new course?
- **Resource(s) being replaced**
    - Title(s)
    - Author(s)
    - ISBN(s)
    - Retail cost (from Amazon)
    - Link to item on Amazon.com
- **Granting category in which you fall (see for additional information):**
    - Creation
    - Modification
    - Adoption
    - Library Resources

- **Alternative(s) to be implemented**: Discuss the materials you are planning to use to replace a traditional textbook (if you would like a consultation on available materials, please contact Jen Waller, Cody Taylor, or your liaison librarian).
- **Project Details**: How will students access the alternative content? If delivering content via the web, what hosting platform do you plan to use?
- **Concerns:** What are your greatest concerns about adopting an alternative textbook solution (both for yourself and or your students)?
- **Assessment:** How will the effectiveness of the new course materials be assessed? Check all that apply
    - Using a supplemental end of semester student evaluation
    - Using a survey I create
    - By comparing assignment grades and/or test scores
    - By comparing grade distributions to previous semesters
    - Using another method, described below
- How did you hear about this initiative?