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From Soup to Nuts: Expanding Liaison and Technical Services for OER Development

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From Soup to Nuts: Expanding Liaison and Technical Services for OER Development

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FROM



TO



Abstract

This case study highlights an ongoing library collaboration with faculty recipients of a statewide open educational resource (OER) textbook grant at a rural public research university in the southeast. It emphasizes the evolving needs of teaching faculty open to OER grant writing and development, and the necessity of librarians to be creative in delivering this support. The authors describe how they expanded liaison and technical service roles to educate faculty about the meaning and benefits of OERs, guided selection of appropriately licensed and pedagogically aligned materials, supported development of the grant proposal, and supported development and maintenance of the OER product itself. Central to this study is how liaison and technical services librarians collaborated with faculty to open up the LibGuides CMS platform to host OER materials. This paper provides a comprehensive case study encompassing service development in

support of the grant funding process, development of the content management infrastructure for hosting and developing the OER product, next steps, and recommendations for best practices. Throughout, the authors argue for the importance of intra-library collaboration and expanding liaison and technical services roles for effective OER support.

Keywords: OER, OER hosting, faculty learning communities, intra-library collaboration, LibGuides CMS

Introduction

Georgia Southern University is a public doctoral and research university located on three campuses in southeast Georgia. Georgia Southern offers 141 degree programs and serves over 26,000 full-time and part-time students. The University Libraries belongs to the GALILEO consortium, an initiative of the Board of Regents of the University System of Georgia (USG). At Georgia Southern, support for open educational resources (OERs) traditionally has been offered through passive educational activities, such as maintaining a generic OER LibGuide and emailing basic information about OERs through institutional listservs. Recently, the University Libraries have taken a more active and integrated approach to supporting OER education and advocacy through workshops, semester-long learning communities, and one-on-one consultations. These efforts are coordinated with the statewide Affordable Learning Georgia (ALG) initiative by a “Library Champion” who works with the campus community and fellow librarians to support OER initiatives campus-wide.

This paper highlights a recent collaboration with faculty recipients of a statewide OER textbook grant at Georgia Southern. Local and regional grant programs invite teaching faculty to

adopt, edit, and create OERs for their courses, but many faculty are intimidated or overwhelmed by sourcing appropriately licensed instructional materials and deciding what to do with these materials once they have them (Allen & Seaman, 2014, 2016). Collaborating with librarians eases the burden of locating these materials, while opening the door to innovative solutions for content management and access (Johnson, 2018). Throughout this case study, the authors emphasize the evolving needs of teaching faculty open to OER grant writing and development, and the necessity of librarians to be creative in developing and delivering this support. To accomplish this, librarians at Georgia Southern expanded liaison and technical services roles to educate faculty about the meaning and benefits of OERs, guided selection of appropriately licensed and pedagogically aligned materials, assisted with the development of the grant proposal, and supported the development and maintenance of the OER product itself.

Central to this case study is how liaison and technical services librarians collaborated with faculty to open LibGuides CMS as a platform for hosting available OER resources to teach introductory Chemistry to first-year engineering students. As the authors describe, LibGuides CMS provided a stable environment with the hosting and editorial capabilities needed to solve the faculty's content management, access, and reporting needs, including integration with the University's Desire2Learn learning management system (LMS). Looking forward, LibGuides CMS opens the door for future collaboration and support, including using LibWizard to create interactive tutorials and assignments for the course. This case study addresses the authors' development of OER-related services for faculty, support throughout the grant collaboration, development of the content management infrastructure for developing and hosting the OER product, next steps, and recommendations for best practices. Throughout, the authors argue for

the importance of intra-library collaboration and expanding liaison and technical services roles for effective OER support.

Literature Review

Rising student material costs have now been a concern of higher education stakeholders for at least two decades. The Bureau of Labor Statistics (2016) shows that college textbook costs have risen notably since the early 2000s, increasing as much as 88% in recent years. While still lower than tuition costs, high textbook costs represent a significant barrier to student success (Croteau, 2017). However, textbook costs alone do not reveal the full picture. Students often must pay for bundled resources that include digital access codes or course-related software packages. These bundled resources are often time-limited or non-transferable, reducing students' ability to save money through the secondary textbook market. This, coupled with overall rising education costs, forces students to make tough decisions concerning course materials. A recent survey at Virginia Tech shows that students are opting to share materials, increase working hours, and reduce course loads to help pay for, or simply go without, the course materials they need to succeed (Walz, 2017). A now well-known Florida study reveals similar results, with students opting not to take certain courses due to the cost of course materials (Florida Virtual Campus, 2019). Such behaviors contribute to course failure and dropout rates, and increase students' time to degree completion (Martin, Belikov, Hilton, Wiley, & Fischer, 2017).

At the same time that awareness of student material costs has increased, higher education stakeholders have begun to explore OER alternatives, beginning with the development of Merlot, publication of PLOS, MIT's requirement that all course materials carry an open courseware license, and the development of what is now OpenStax by Rice University (Bliss & Smith, 2017). Through these and other efforts, instructors and OER advocates have shown that students

can perform just as well using open resources, and that students rate low and no-cost materials favorably (Hilton, 2016; Todorinova & Wilkinson, 2019). As a result, a growing number of institutions and university systems have focused efforts on OER development to manage student material costs (Bliss, Robinson, Hilton, & Wiley, 2013; Farrow et al., 2014). Moreover, as OERs have become more widely adopted, educators have discovered benefits beyond cost management, including equal access to materials from the first day of class; increased student engagement; lower drop, fail, and withdrawal rates among at-risk populations; and slightly higher grades among at-risk students (Colvard, Watson, & Park, 2018).

For several years now, these and other benefits have contributed to broad institutional and system-level administrative buy-in for OERs, especially for high-enrollment core courses and lower-division STEM courses that tend to use expensive texts that are updated frequently. At the same time, however, the transition to OERs has been slow for many institutions (Doan, 2017). While the reasons for this are varied, several sources indicate that locating appropriate OER materials and setting aside time to overhaul curricula are significant barriers to faculty for developing OER materials (Allen & Seaman, 2016; DeVries, 2013; Wang & Towey, 2017). Addressing these concerns has led institutions and university systems to develop a diverse array of awards and funding-based incentives for faculty to research, review, create, and adopt OERs. These incentives exist at the state level (e.g., Georgia, Oregon), the system level (e.g., SUNY), and the institution level (e.g., Temple), with varying degrees of impact and success (Bell & Salem, 2017).

Given the nature of these barriers, librarians have an important role to play supporting the development and adoption of OERs. Librarians' unique background in information searching, copyright and licensing, and information delivery, along with their long history of collaboration

with faculty and campus units, make them strong partners for OER funding, development, and delivery (Bradlee & VanScoy, 2019). To a great extent, however, librarians have fulfilled this role by simply folding OER support into traditional library services already familiar to faculty. For example, several case studies highlight strategies for educating faculty about OERs in general or supporting faculty education with one-shot options, such as workshops or webinars (Jensen & West, 2015; Mitchell & Chu, 2014; Primary Research Group Staff, 2017). While these strategies are important for building faculty awareness, they risk falling short of helping faculty progress confidently and successfully through OER development, implementation, and assessment.

Getting Started: Affordable Learning Georgia

In 2014, USG announced its first statewide call for textbook transformation grant proposals through a new initiative, Affordable Learning Georgia (ALG). This initiative provides funding to faculty willing to overhaul a portion of a course or an entire course using OERs. Faculty members have the option to adopt outright, adopt and adapt, or create materials from scratch. ALG also supports the option to use library subscription materials when available, as these resources do not incur additional costs for students. Initial awards largely targeted faculty teaching high-enrollment core courses with high material costs and high student impact numbers. More recently, ALG has begun granting awards to higher-level courses and now offers mini-grants to faculty willing to develop ancillary materials for courses already using OERs. As of Spring 2019, ALG has awarded 334 grants impacting over 296,000 students and providing over \$51 million in cost savings (alg.org).

Like many institution and state-level OER funding initiatives, ALG relies heavily on librarians to serve as liaisons between the funding agency and faculty. As part of the initiative,


each institution's library designates a "Library Champion" whose role is to advocate, educate, and work with faculty and administrators to encourage an OER-friendly climate on campus. ALG provides advocacy training and professional development opportunities to the Champions, including webinars, special panels, and Creative Commons certifications. Monthly virtual meetings also allow Champions to share success stories, troubleshoot concerns, brainstorm, and keep up with OER activities at each institution. Each spring, ALG sponsors interested Champions to attend the Teaching and Learning Conference in Athens, GA. ALG holds a yearly function in Macon, GA to highlight new developments in open access and OERs. ALG has a strong presence at the annual Georgia Libraries Conference and other meetings across the state. These opportunities create a sense of community for the Champions and contribute to a strong support system for promoting OERs across the USG. Such support is important to the success of the initiative as most Champions take up this role voluntarily in addition to their other job duties.

Of course, some institutions have had better success than others realizing the goals of the ALG initiative. For a number of years, Georgia Southern University lacked a dedicated Library Champion. In Spring 2017, the Library Dean appointed a new Champion after serving in this role himself. For the new Champion, most of her first year in this role was spent learning about ALG and connecting with colleagues statewide. During this first year, the Champion was able to conduct two one-shot faculty workshops and develop a new LibGuide introducing the OER concept and outlining ALG grant requirements (<https://georgiasouthern.libguides.com/nocostlowcost>). During Spring 2018, the Champion was able to partner with Georgia Southern's Center for Teaching and Excellence (CTE) to provide two additional OER workshops as part of the CTE's ongoing faculty development series. Attendance at these workshops was low, with only five total attendees. However, some faculty

attended multiple workshops even after receiving emails explaining the content had not changed. Conversations and questions following the workshops revealed to the Champion and CTE personnel the depth, breadth, and complexity of participating faculty members' questions and concerns about implementing OERs for their courses, indicating that the traditional liaison approach to faculty OER education was inadequate for faculty needs. As a result, the Champion and CTE personnel committed to developing a semester-long Faculty Learning Community (FLC) for Fall 2018, with the expectation that an extended, immersive training experience would address questions and concerns raised during the spring workshop.

Increasing Engagement: The Faculty Learning Community

During Fall 2018, the Champion partnered with CTE personnel to offer a six-week FLC on OERs and ALG grant funding opportunities. The FLC met biweekly from September through November. Faculty attending the Spring 2018 workshop were personally invited to participate as they had previously shown interest. Furthermore, CTE personnel added the FLC to their faculty training calendar and advertised it via their monthly newsletter and website. The Champion drafted emails for the other library liaisons to target faculty who had shown interest or asked questions about OERs or ALG grants. As a result, eight faculty from across campus signed up for the FLC.



Workshop Time

Open Educational Resources (OER) FLC

Open Educational Resources (OER) have been on the discussion table for several years. Perhaps you have thought about incorporating OERs into your own courses? Perhaps you wonder how this is possible, or when/how you would ever find the time to revamp a course? Join the OER Faculty Learning Community and explore your options. Academic Librarians and the Center for Teaching Excellence (CTE) will provide guidance in types/availability/options of OER materials, as well as guidance in designing a course using OER. Faculty who participate will work towards building a proposal to submit to Affordable Learning Georgia for an upcoming round of Textbook Transformation Grants.

Statesboro and Armstrong campuses
Sept. 12 and 26, Oct. 24, Nov. 7
10:00-11:00 AM

Figure 1. Portion of CTE Newsletter announcing the OER FLC.

Goals of the FLC included mentoring faculty to 1) develop a working knowledge of open access and OERs, 2) learn how to search for and evaluate appropriate OER content, 3) understand Creative Commons licensing and its use in the OER context, and 4) learn how to develop and assess learning objectives in courses using OERs. The target end product of the FLC was for participating faculty to develop, and ideally submit, one or more ALG textbook transformation grant proposals. Taking a team approach, the Champion provided guidance on OER research and evaluation, while CTE personnel provided guidance on course design, pedagogy, and assessment using OERs. The instructional team utilized online tutorials developed by ALG, scholarly and popular readings and websites, and the libraries' OER LibGuide to

centralize research on available and appropriate OER materials. All readings, videos, the LibGuide, and other materials were delivered using the university's Desire2Learn LMS. Participating faculty were asked to complete readings and videos outside of designated meeting times and answer brief questions for discussion during the face-to-face meetings. These meetings provided an opportunity for the instructors to clarify questions and concerns and to delve deeper into areas of specific interest.

Following this highly structured format, the FLC provided dedicated time for faculty to think about their courses and specific course objectives and gave the Champion opportunity to address any barriers to locating course materials at the point of need. The Champion was able to walk faculty through the effective use of tools developed to help them locate these materials. Participants were able to explore specific searches during face-to-face meetings, allowing the Champion to discuss the pros and cons of various resources and how they might be adapted to their curricular needs. Moreover, the Champion was able to leverage her subject area expertise to aid material selection. For example, the Champion's awareness of the peer-review status of available OERs helped to alleviate faculty concerns about their appropriateness to a particular curriculum. Indeed, several faculty participants in the Fall 2018 FLC expressed concern about their ability to evaluate OER materials for quality, effectiveness, and licensing status. While this level of support may be outside faculty members' normal expectations for liaisons (Bradlee & VanScoy, 2019), reevaluating librarians' specific duties and modeling these to faculty through FLC and similar instructional modalities can help change these attitudes.

Similarly, partnering with an instructional design specialist, whether this is a librarian or someone from another academic support unit, can help to address any pedagogical issues related to course design or how to utilize particular OERs to achieve student learning outcomes. One

barrier not often discussed in the literature is that faculty may have no significant experience selecting instructional materials for their courses. Often, curricula or textbooks are chosen for faculty by departments, or faculty simply choose a well-known or widely adopted option within their discipline. The Champion and CTE personnel observed this with faculty during the Fall 2018 FLC. On several occasions, faculty expressed anxiety and raised concerns about not finding test banks, slide decks, or other ancillary materials prepared alongside the OER materials they were considering for their courses. Having instructional design expertise available helped to ease this source of stress and provide confidence to faculty.

Pulling in persons familiar with copyright and re-use licensing also helps when working with faculty to understand how materials may be modified and reused in their courses. Given the FLC's team approach, the Champion was able to bring in the Discovery Services Librarian from the library's technical services department, who facilitates faculty workshops covering copyright, authors' rights, and re-use licensing in the institutional repository. Involving the Discovery Service Librarian, who faculty were already aware of and trusted on these topics, was a natural fit to provide this information. For most of the faculty participating in the workshops, authoring, editing, and publishing OER content is outside of their publishing experience. During the Fall 2018 FLC, the faculty also displayed significant anxiety about receiving credit for their work and were skeptical of allowing others to create derivatives of their work. This was due in part to ALG's requirement that the Creative Commons license CC-By be applied to any materials produced under an ALG grant. Understanding this requirement was important for any faculty intending to submit a grant proposal.

As previously mentioned, prior to the development of the FLC, OER-related library support was largely limited to general OER instruction and referral to the library's LibGuide. By

contrast, the main takeaway of the Fall 2018 FLC was to facilitate discovery of OERs that would meet the specific learning objectives of participating faculty members' courses and the ALG grant requirements. As part of their training through ALG, Champions are instructed on the rubric ALG uses to review all grant proposals. Proposals must include an outline for delivery, accessibility, and assessment of course learning objectives and students' reactions to the course materials. With this training, Champions are prepared to help faculty develop proposals that are well paced and achievable within ALG's required timeline for implementation.

At the completion of the FLC, two teams of Chemistry faculty felt confident enough to submit proposals for one of ALG's textbook transformation grants. The proposal was due December 2018, and neither group was awarded funding. However, reviewer feedback made clear that both proposals required only minor revisions to be successful. With encouragement from the Champion and CTE personnel, both teams resubmitted in Spring 2019 and received full funding. ALG provides a full year for faculty to implement their plan and begin utilizing the OER materials within the designated course.

From Grant to Implementation: Evolving Library Support

Beginning in Summer 2019, the Champion has continued work with one of these teams as the faculty have transitioned from the grant application process to OER development and implementation. The team is developing an online textbook for a specialized Chemistry course required of all first-year Engineering majors. A significant issue with the current proprietary textbook is that none of the included examples or problem sets is engineering-related, and so it fails to engage the students. To address this, the team has elected to adapt the OpenStax *Chemistry 2e* textbook for the course. The OpenStax text is similar in content and organization to the current textbook and has received positive reviews from other faculty in the USG system, and

the team feels that they can successfully adapt it to an engineering audience without disrupting their teaching style. While the faculty will need to update examples and problem sets over time, adapting this text means that the team does not need to start from scratch.

While electing to adapt the OpenStax text has reduced the need to originate new content, this plan has raised platform hosting and delivery challenges not fully anticipated during the FLC or grant funding process. Namely, the faculty require the ability to migrate, host, and revise this text, and they need a platform that will allow them and future instructors to update the text without specialized platform knowledge. Because instructors may change over time, it is important that the text be accessible and editable by anyone teaching the class going forward. Moreover, the faculty require a platform that supports accessibility, assessment, and the ability to integrate the text into the university's Desire2Learn LMS. Given these needs, the library's collaboration with and support for the team will continue throughout development and implementation, for the foreseeable future.

To address the team's platform hosting and delivery needs, the Champion again reached out to colleagues in the technical services department who have experience with content hosting, management, and delivery. Together, the Champion and Discovery Services Librarian evaluated the OpenStax website and text, and determined that neither the library nor ALG's document-centric institutional repository (IR) would provide an appropriate platform. While IRs have been widely adopted to host OERs and help to ensure the preservation of this content, they are less well suited to OER content that is dynamic or likely to be updated frequently by multiple stakeholders. Moreover, because this text makes extensive use of the MathML XML standard and the MathJax JavaScript library to display equations, the faculty require a platform that accommodates both in order to ensure accessibility and preserve as much of the OpenStax source

material as possible. After considering a number of hosting solutions, and given the library's prior experience hosting student-created work (Mortimore & Baker, 2019), the Champion and Discovery Services Librarian determined that LibGuides CMS was the best available solution.

Springshare LibGuides and LibGuides CMS offer hosting, access, and permission controls that support extraordinary flexibility, both in terms of content and display and editorial access and control. Specifically, LibGuides CMS supports administrators' ability to apply unique access and permission controls to individual guides or groups of guides and unique look and feel settings, including page templates, language settings, and custom guide or group-level CSS and JavaScript (JS). Because access and permission controls are applied at the guide or group administrator level, library administrators are able to cordon off guides from each other and from platform-level configurations. In this way, administrators can open up highly customized guides to faculty editors while protecting library-created content. Moreover, because LibGuides and LibGuides CMS are patron-facing platforms closely integrated with Springshare's other products, including LibWizard, they are well suited to meet the accessibility needs of students and the assessment needs of faculty and grant funders.

During early Summer 2019, the Champion proposed LibGuides CMS as a solution to the team and arranged for the Champion, Discovery Services Librarian, and faculty to meet for an initial consultation. During this meeting, the Discovery Services Librarian introduced the platform to the faculty, recommended a single LibGuide to host the OER, and developed a preliminary workflow for the librarians and faculty to create an initial table of contents and identify content for migration to the LibGuide. Following this meeting, the librarians and faculty held a half-day workshop, during which the Discovery Services Librarian determined the faculty's level of comfort working with OpenStax HTML, provided the faculty with basic

training on migrating and editing content in LibGuides, and began initial testing of migrated content.

During and after this session, the faculty worked with the Champion and Discovery Services Librarian to identify and resolve several content migration challenges. For example, the faculty and Discovery Services Librarian initially migrated content to the LibGuide by cutting and pasting the text, images, and equations directly from the OpenStax webpages. However, this method converted the equations into SVG images, rendering them so they could not be copied, viewed by screen readers, or easily edited following import. This undermined the faculty's need for accessibility and ongoing editorial control of the equations. Furthermore, the presence of these images greatly increased the number of HTML characters required to represent the content on the page, outstripping Springshare's 65,000-character limit for Rich Text/HTML fields. This complicated content migration and risked interfering with future editing because the HTML would need to be spliced across numerous content area fields on each page.

Through trial and error, the Discovery Services Librarian and the faculty resolved these initial migration challenges, supporting the display of complex OER content in LibGuides (see Figure 2). After further experimentation with the OpenStax content, the Discovery Services Librarian determined that the XML files OpenStax provides for offline use could be modified and uploaded in lieu of copying and pasting the content directly from the webpage. This method has the advantage of importing the equations in MathML format, which uses fewer HTML characters and is easier for the faculty to edit. Moreover, this method allows the Discovery Services Librarian to utilize the MathJax JavaScript library via Springshare's Guide Custom CSS/JS feature to display the equations, preserving accessibility and their ability to be copied. Using the file manifest in OpenStax' offline file directory, the faculty first identified which XML

should be used to populate each page in the OER. The Champion and Discovery Services Librarian then extracted the XML files, removed any unneeded code, batch updated the image source URLs, and imported the modified XML into the LibGuide. While the XML for some pages still exceeded the 65,000 character limit for Rich Text/HTML fields, the overall reduction in characters made it easier for the Champion and Discovery Services Librarian to splice the code into fewer fields with less disruptive breakpoints.

GEORGIA SOUTHERN UNIVERSITY

University Libraries / Library Guides Chat

Chemistry Textbook

Introduction

1. Essential Ideas ▾

2. Atoms, Molecules and Ions ▾

3. Composition of Substances and Solutions ▾

4. Stoichiometry of Chemical Reactions ▾

5. Thermochemistry

Energy Basics

Calorimetry

Enthalpy

Summary

End-of-Chapter Problems

6. Gases ▾

7. Chemical Bonding and Molecular Geometry ▾

8. Liquids, Solids, and ▾

Thermochemical Guidelines of Enthalpy

By the end of this section, you will be able to:

- State the first law of thermodynamics
- Define enthalpy and explain its classification as a state function
- Write and balance thermochemical equations
- Calculate enthalpy changes for various chemical reactions
- Explain Hess's law and use it to compute reaction enthalpies

The following conventions apply when using ΔH :

- A negative value of an enthalpy change, $\Delta H < 0$, indicates an exothermic reaction; a positive value, $\Delta H > 0$, indicates an endothermic reaction. If the direction of a chemical equation is reversed, the arithmetic sign of its ΔH is changed (a process that is endothermic in one direction is exothermic in the opposite direction).
- Chemists use a thermochemical equation to represent the changes in both matter and energy. In a thermochemical equation, the enthalpy change of a reaction is shown as a ΔH value following the equation for the reaction. This ΔH value indicates the amount of heat associated with the reaction involving the number of moles of reactants and products *as shown in the chemical equation*. For example, consider this equation:

$$\text{H}_2(g) + \frac{1}{2}\text{O}_2(g) \longrightarrow \text{H}_2\text{O}(l) \quad \Delta H = -286 \text{ kJ}$$

This equation indicates that when 1 mole of hydrogen gas and $\frac{1}{2}$ mole of oxygen gas at some temperature and pressure change to 1 mole of liquid water at the same temperature and pressure, 286 kJ of heat are released to the surroundings. If the coefficients of the chemical equation are multiplied by some factor, the enthalpy change must be multiplied by that same factor (ΔH is an extensive property):

(two-fold increase in amounts)

$$2\text{H}_2(g) + \text{O}_2(g) \longrightarrow 2\text{H}_2\text{O}(l) \quad \Delta H = 2 \times (-286 \text{ kJ}) = -572 \text{ kJ}$$

(two-fold decrease in amounts)

Figure 2. OER LibGuide page with modified OpenStax XML and MathML encoded equations. Equations are displayed using the MathJax JavaScript library.

To date, the Champion and Discovery Services Librarian have completed migrating the OpenStax content to the OER LibGuide. By doing so, they have freed the faculty to focus

attention on revising the text, examples, and problem sets for the Engineering majors who will be taking the course. Once the faculty have completed this task, the Discovery Services Librarian will normalize the CSS across pages using LibGuides' Guide Custom JS/CSS feature, ensuring a consistent look and feel. While this step is not necessary, given that the initial import is sufficient to deliver usable text, the process of re-styling the text is simplified by utilizing the offline files. Unlike the copy and paste method, which introduces extensive in-line styles into the HTML, using modified offline XML preserves source IDs, classes, and tag attributes that can be used to develop a single style sheet for the entire LibGuide.

As the faculty have worked with the imported OpenStax content, they raised additional content and feature requests requiring librarian support. For example, in the course of researching additional content to include in the OER, the faculty identified an open source interactive simulation from PhET at the University of Colorado, Boulder. Unfortunately, the simulation is available only in Java, which cannot be run natively in the browser and requires students to have Java installed on their computers. Moreover, unless students know how to open and run the application on their computers, they may have difficulty using it. In order to increase the likelihood that students will successfully download and access the simulation, the Discovery Services Librarian uploaded a copy of the Java Archive (JAR) file to LibGuides, created and uploaded an associated Java Network Launch Protocol (JNLP) file, and created a link to the JNLP file on the LibGuide page. Now when students download and open the JNLP file, the Java Web Start software automatically downloads and runs the simulation.

Similarly, as the faculty have continued to reflect on assessment, they have requested usage data that goes beyond what Springshare's RefAnalytics reporting tool supports. For example, in addition to page and asset views, the faculty are interested in collecting data about

entry and exit pages, page link clicks, and video views. As a result, the Discovery Services Librarian has created and embedded a Google Analytics profile targeting the OER using LibGuides' Guide Custom JS/CSS feature. This profile is associated with a delegated Gmail account, which ensures access continuity as instructors change over time. Furthermore, it ensures that only instructors of record are provided access to usage data consistent with FERPA and IRB guidelines. As assessment needs continue to evolve, the Discovery Services Librarian may further employ Google Tags or Google Analytics' Campaign URL Builder.

During Fall 2019, the faculty will continue to modify the OpenStax content now migrated to the OER LibGuide. As they do so, they will gain experience revising content on LibGuides CMS and lay the groundwork to hand the OER over to new instructors as they take responsibility for the course. As use of the OER evolves, the Champion and Discovery Services Librarian anticipate further collaboration, including training the faculty to develop interactive tutorials and assignments using Springshare's LibWizard module. Doing so will further extend the OER's value for conducting student assessments and required assessments for ALG. While this level of faculty-librarian collaboration is extensive and may not be sustainable for all OER projects, the faculty's current progress toward delivering the OER has depended heavily on intra-library collaboration and expanding liaison and technical services roles as needed.

Observations and Best Practices

Faculty barriers to OERs are not singular or discrete. In this study, what presented itself as a barrier early on (e.g., locating an appropriate OER) evolved as the process moved forward. The teaching faculty in this study expressed different anxieties, questions, and stumbling blocks at each stage in the creation of their course material. In the beginning, the most prevalent anxiety centered on understanding and finding OER content. This anxiety spilled over to time

management anxiety. At times, the faculty panicked over the work required to completely overhaul a course. Once faculty became comfortable finding and evaluating OER content, anxieties about copyright and reuse licensing requirements surfaced. Each of these anxieties mingled with the anxiety of tackling a course with limited ancillary materials available to guide the faculty's teaching strategy. To meet these anxieties and lessen these barriers, librarians must be flexible. While the FLC began with a set syllabus and learning objectives, concerns brought by the faculty frequently necessitated a change of plans and several on-the-fly explorations of resources, copyright issues, and examples of successful OER implementation at other institutions in similar courses. Many of the Champion's planned lectures were scrapped to allow faculty time to search for OERs and ask questions. By supporting an interactive and inviting environment, the FLC format made addressing these barriers possible and kept the faculty engaged. Furthermore, the learning community format creates the expectation that additional work and exploration will take place outside of scheduled meeting times, allowing for a more in-depth exploration of topics during face-to-face sessions.



Figure 3. Timeline of project outlining number of one-shot workshops, attendance, progression of FLC, and grant proposals.

Collaboration among librarians and other campus entities has also proved essential for making a variety of expertise and skills available to faculty as they work through whatever barriers they encounter. Working in a team removes the unrealistic expectation that one person can be an expert in all areas of OER development. Prioritizing expectations and sharing

workflows also facilitates success. As mentioned earlier, the Champion and Discovery Services Librarian performed the initial migration of text over to the LibGuide for the faculty. Taking care of tasks outside faculty members' interest or expertise ensures that faculty remain focused on tasks more suited to their strengths. Indeed, throughout this collaboration, the authors relied on intra-library collaboration to address the breadth of barriers presented by this project. This may prove more difficult for librarians at small institutions with minimal staff, but having solid foundations in place to help answer faculty concerns should help. A well developed tutorial or LibGuide can help provide guidance in searching, copyright issues, and pedagogical practices that work best with open materials.

Lastly, librarians should be prepared to support OER projects well beyond the grant award. Hosting, enhancement, and long-term management of the OER product are central to faculty concerns about the viability of OER adoption. These barriers can stall or kill an OER project if librarians fail to support faculty through this part of the process. Fortunately, librarians often have at their disposal technical services expertise and hosting tools to address this. Librarians should be prepared to think critically and creatively about how existing content management tools, including IRs and LibGuides CMS, can be adapted to meet content management needs. Providing this level of service is consistent with academic librarians' growing awareness of their role supporting students and faculty as content creators (Jackson, Pierard, & Schadl, 2019).

Conclusion

Effective OER support requires shifting thinking from a one-shot instructional model to an understanding that faculty needs will vary and evolve as they delve into these materials. Librarians are well positioned to bring a variety of expertise and skills to this process. Expanding

and redefining liaison and technical service roles allows creative solutions and provides strong scaffolding for faculty support. Providing guidance throughout the OER process strengthens the relationship between librarians and faculty and creates opportunities for deeper collaboration across the institution.

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