

## **Open Educational Engineering Resources: Adoption and Development by Faculty and Instructors**

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As the cost of higher education has continued to rapidly rise, the associated student government organization at Washington State University successfully launched a Course Material Cost Reduction Initiative<sup>1</sup>. In their statement to the Provost's Office, campus bookstore, and Faculty Senate, students called on instructors and administrators to consider strategies for reducing the cost of course materials<sup>1</sup>. Following discussion, the campus responded by creating a task force, which ultimately recommended, among other things, increased use of open educational resources (OERs) on campus<sup>2</sup>. The task force made initial forays into open education by matching available OERs to general-education undergraduate courses such as introductory biology, mathematics, and history. However, when addressing engineering courses, they encountered unique problems related to the availability of appropriate resources and the organization of departmental selection processes. For this project, the scholarly communication librarian and the engineering librarian at the university have come together to work with the College of Engineering to address the best way to incorporate OERs into upper-division undergraduate courses for engineering students. As a basis for this work, the librarians have surveyed and interviewed faculty and instructors about their perceptions and needs related to OERs. Based on this work, the authors suggest best practices for liaison librarians in engineering and other specialized fields who wish to incorporate OERs into their outreach work.

### Introduction

In 2016, the associated student body at Washington State University put forward a Course Material Cost Reduction Initiative<sup>1</sup>, calling on instructors and administrators to identify strategies for reducing students' financial burden. Among other things, the students recommended creation of a university task force to consider the issue, introduction of an open-source program, faculty education on the cost of course materials, and standardization in the use of quick-response systems (clickers, etc.)<sup>1</sup>. In response to this statement by the associated students, the Provost's Office established a task force, which evolved into a steering committee that recommended, among other things, the increased use of open education resources (OERs) on campus<sup>2</sup>.

Washington State University is not alone in its recent interest in open educational resources. Open education has been a rising trend throughout the 2000s, since the phrase was coined by the United Nations Educational, Scientific, and Cultural Organization (UNESCO) in 2002<sup>3</sup>. As defined by UNESCO, OERs are "teaching, learning or research materials that are in the public domain or released with an intellectual property license that allows for free use, adaptation, and distribution"<sup>4</sup>. OERs have been implemented in projects ranging from MIT's OpenCourseWare project to Carnegie Mellon's Open Learning Initiative and Rice University's Connexions and OpenStax textbooks<sup>5-7</sup>. Universities and community colleges have increasingly offered incentives for instructors to adopt OERs in order to increase student access to course materials<sup>8</sup>. Due in part to these new initiatives, OERs have entered the market as true players in course material selection. To cite one statistic, OpenStax reports that students have saved more than \$155 million since 2012 by using the organization's open textbooks<sup>9</sup>.

As open education has built momentum, libraries have quickly rallied in support. Projects like Open Textbook Library, BCcampus, Open SUNY, and MERLOT have invited librarians to use their cataloging, organizational, and outreach skills to assist faculty members and students in finding and evaluating open educational resources. Numerous papers have emerged that call on librarians to support open education by developing their knowledge of open pedagogies and open-access publishing, increasing outreach to faculty members, developing capacity for library publishing, and building and maintaining repositories of open content<sup>10-15</sup>. Top-down support for open education has also built at professional library organizations. In its white paper on the “Intersections of Scholarly Communication and Information Literacy,” the Association of College and Research Libraries (ACRL) points out how instruction and liaison librarians need to understand open-access publishing because they are constantly “teaching informally and formally about the changing nature of scholarship and art in the digital world”<sup>16</sup>. The paper advocates integrating discussion of scholarly communication (including open-access publishing) into workshops, faculty meetings, online instructional materials, and campus committee meetings, while remaining cognizant of “disciplinary differences” across programs<sup>16</sup>. This guidance from ACRL adds another dimension to the work of liaison librarians, as identified in the literature of embedded and liaison librarianship<sup>17-19</sup>.

A point frequently reiterated in the literature on embedded librarianship is that libraries must establish strategic partnerships with programs and faculty members in order to effectively advance the liaison program. We, the scholarly communication and engineering librarian at the university, applied this practice by first consulting with the Associate Dean of Undergraduate Education in the College of Engineering before speaking to faculty members about OERs. The associate dean identified gateway courses in the College of Engineering where OERs could make a significant impact on students. He also described departmental culture and practices for selecting course materials, including use of curriculum committees. This conversation was foundational to our work in setting up surveys and interviews with engineering faculty and in keeping with practices of embedding, which emphasize partnership between libraries and academic disciplines.

Our interviews help elaborate best practices in liaison librarianship but they also contribute to a previous literature on faculty perceptions of open educational resources. Researchers have previously identified altruistic, commercial, and transformational incentives to faculty members to make use of OERs<sup>20</sup>. On the other hand, OER use presents teaching faculty with challenges around copyright, quality, sustainability, interoperability, technical demands, cultural and language barriers, cost, exploitation of labor, and lack of institutional policies and incentives<sup>20-25</sup>. These incentives and challenges have been presented in a number of seminal studies. For instance, studies conducted in 2008 and 2010 revealed that faculty members at Tufts and various schools in California had reservations about using OERs due to perceived loss in content quality, time pressures, and loss of compensation for authors<sup>26; 27</sup>. Drawing on these results, the organizers of the 2010 survey concluded, “Faculty are independent thinkers, exceptionally busy, suffer from extreme information overload, are generally dedicated to ensuring their students' success, and do not take well to ‘one size fits all’ solutions”<sup>26</sup>. Later surveys revealed more neutral or positive responses to OERs. A Florida Virtual Campus survey in 2012 found that three-quarters of some 2,500 faculty respondents had heard of OERs and were likely to use them in the future<sup>28</sup>. In 2014, the Babson Survey Research Group collected responses from 2,144

faculty members, 87.8% of whom stated that OERs seemed to be of the same or better quality than traditional materials<sup>29</sup>. A 2014 survey of 1,637 faculty members at 56 universities in Turkey also found that faculty mostly perceived OERs in a positive light but had concerns about quality and IP protections for authors<sup>30</sup>. Finally, in 2016, John Hilton, III, reviewed five of the largest perception studies to date and concluded that a “strong majority” of instructors “believe OERs are as good or better than traditional textbooks”<sup>31</sup>.

While these large-scale surveys are helpful in uncovering general trends in open education, little work has been done to assess discipline-specific attitudes toward OERs. Thus far, discipline-specific work includes a survey conducted in 2006, presenting reasons why engineering faculty at MIT did not choose to participate in MIT OpenCourseWare. Stephen Carson, the author of the resulting report, found that 75% of faculty had opted to publish their courses and that the remaining 25% chose not to participate due to concerns about quality, requisite time investment, copyright, and the future marketability of material published openly<sup>32</sup>. Similarly, in a special issue of *IEEE Transactions*, editors Edmundo Tovar and Nelson Piedra presented the experiences of engineering faculty who had used OERs. Tovar and Piedra point to examples of successful OER use to note that the quality of open resources should be “considered relative to the target audience”<sup>33</sup>. In keeping with this argument, instructors in the issue discuss how they used OERs to advance curricula, engage students in the creation of materials across a range of skill levels, and support students who frequently miss class<sup>34-37</sup>.

While studies by Carson, Tovar, and Piedra are helpful in understanding the perspectives of engineering faculty on OERs, we hoped to contribute to this discussion by surveying and interviewing faculty members and instructors at our university<sup>32; 33</sup>. We believed that surveys and interviews would contribute to a discipline-specific understanding of faculty attitudes toward OERs and, additionally, would suggest best practices for liaison librarians working in engineering and STEM fields. Ultimately given the growing campus interest in course material cost reduction, this study worked to achieve the following outcomes:

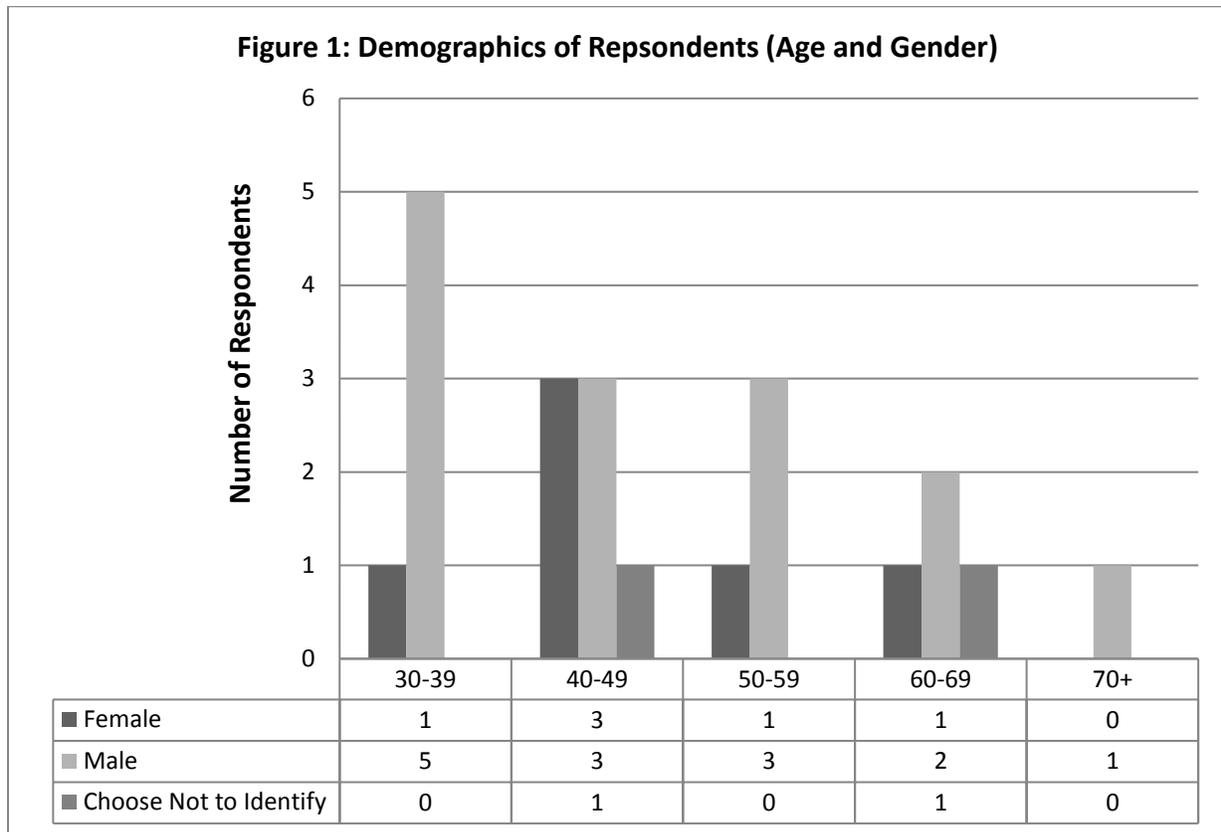
1. Gauge the understanding and perceptions of engineering faculty members and instructors with regard to OERs in order to structure library outreach activities.
2. Analyze survey and interview results in order to disseminate best practices for OER outreach.

### Faculty and Instructors Open Education Resources Survey

To gain insight into faculty understanding of open educational resources, we began with a survey (Appendix A). The survey was sent to all engineering faculty, clinical faculty, and instructors at the end of the fall semester and once again at the beginning of the spring semester via email. It was timed as courses ended and again as faculty began preparing for the next semester. Before sending surveys and during the development of this research, we petitioned for and received exempt status from our University IRB following review by the Office of Research Assurances.

Once released, our survey had a 13% completion rate, which was 22 responses out of 168 faculty and instructors contacted. While these responses are by no means considered comprehensive nor representative of all engineering faculty, our completion rate benefitted from a strong

relationship between the liaison librarian and the College of Engineering. Figure 1 shows the demographic breakdown of the respondents by age and gender, Figure 2 by faculty or instructor ranking, and Figure 3 by department or school within the College of Engineering.



**Figure 2: Demographics of Respondents (Ranking)**

<i>Rank</i>	<i>Frequency</i>	<i>Relative Frequency (%)</i>
Instructor	1	4.5
Clinical Associate Professor	1	4.5
Associate Professor	6	27.3
Assistant Professor	5	22.7
Professor	8	36.4
Choose not to identify	1	4.5

<b>Figure 3: Demographics of Respondents (Department/School)</b>		
<i>Department or School</i>	<i>Frequency</i>	<i>Relative Frequency (%)</i>
Choose not to identify	2	9.1
Voiland School of Chemical Engineering and Bioengineering	4	18.2
School of Electrical Engineering and Computer Science	3	13.6
Mechanical and Materials Engineering	7	31.8
Civil and Environmental Engineering	6	27.3

To determine familiarity with OERs, we also included a multiple-choice question with options ranging from no familiarity to having used an OER in a course (results shown in Figure 4).

<b>Figure 4: Familiarity with OERs</b>		
	<i>Frequency</i>	<i>Relative Frequency (%)</i>
No, I have never heard of them until today	1	4.5
Yes, I have heard of them but know very little about them	14	63.6
Yes, I have searched for them and perused a few	4	18.2
Yes, I have used open educational resources in one or more classes	2	9.1
No response	1	4.5

In response to a question about having ever considered using an OER in a course, 48% of respondents indicated that they have never used or considered OERs. Other respondents indicated that they had used OERs, had examined them in the current semester, or had looked at them 5-10 years previously.

At the end of the survey, four open-ended questions asked faculty to reflect on their students' response to OERs, the quality of OERs, the suitability of OERs for engineering courses, the benefit of OERs as opposed to commercial textbooks, and any concerns regarding OER use in engineering courses. The open-ended questions were coded into categories using inductive coding. Not all respondents answered all of the open-ended questions. These are reported in the following figures as "no response."

In response to the first open-ended question regarding student responses to OERs, some faculty members noted cryptically, "The students like them", "Fine", and "Students rarely read the book unless there are problems assigned and the book has a template to solve them." Others noted that students value the content of OERs above all. For instance, one instructor commented that students "appreciate the ability to get the concepts presented to them by two different viewpoints"—a potential benefit for courses where OERs are listed as recommended supplementary resources. Another respondent remarked that "students prefer being given short, focused information, as opposed to a textbook," and another concluded that "students appreciate having the material for free...but, of course, the quality of the content is the important thing. Who cares if it's free if it's also awful?" More than one response highlighted the potential of using open education to support students with various learning styles, including students who may not respond well to traditional textbooks and the typical presentation format in such books.

In Figure 5, we have coded responses to the first open-ended question using the following categories to characterize student reactions to OERs: No prior experience with OERs, general positive response to OERs ("liked" them), positive response to the low cost of OERs, other perspective, and no response.

While pointing to the potential benefit of OERs, faculty members and instructors had more mixed views about the quality and suitability of OERs for engineering courses (responses to the second and third open-ended survey questions, presented in Figure 6).

Responses to questions about quality and suitability of OERs ranged from "marginal quality" and "quality is low making them unsuitable for use in the classroom" to "they vary and some of them are of high quality." More than one instructor remarked on the difficulty of finding engineering OERs—a problem that we also encountered while preparing for our conversations with instructors. As one faculty member noted, "[I] have seen little that's out there in the way of engineering material in general and upper-division engineering material in particular." Finally, regarding OER quality, one faculty member indicated that the conversation has shifted "because the students don't consider quality as the primary value in an information resource; convenience and ability to share are primary." The instructor concluded that the evaluation of information is the main disconnect between faculty and students regarding course materials.

<b>Figure 5: If you have used OERs in an engineering course, how did your students respond to the material?</b>		
	<i>Frequency</i>	<i>Relative Frequency (%)</i>
No prior experience with OERs	6	27.3
General positive response	3	13.6
Positive response to low cost	2	9.1
Other perspective	1	4.5
No response	10	45.5

<b>Figure 6: If you have evaluated OERs in the past, what is your perception of their quality and suitability for engineering students?</b>		
	<i>Frequency</i>	<i>Relative Frequency (%)</i>
No Experience	6	25.0
Varying quality	6	25.0
Limited discipline resources	2	8.3
Lack of content control	1	4.2
No Response	9	37.5

To gain a different perspective, the next open-ended question asked faculty members and instructors to reflect on the benefits of OER materials over commercial textbooks. As expected, instructors overwhelmingly remarked on the cost savings for students who can use OERs (see Figure 7).

<b>Figure 7: What benefits do you see for using open educational resources rather than commercial textbooks?</b>		
	<i>Frequency</i>	<i>Relative Frequency (%)</i>
Cost Reduction	13	41.9
Access	3	9.7
Ability to edit	2	6.5
Quality	1	3.2
Interactive	1	3.2
No experience with OERs	2	6.5
No response	9	29.0

One instructor commented that many faculty members are already using OERs without knowing it, as they have replaced textbooks with web content. Another respondent spoke to the format and characteristics of OERs themselves, noting that OERs facilitate inclusion of more practice problems, interactive problem-solving, updated materials, and peer support for fellow students. Another respondent indicated that OERs solve an all-important access problem for students. This respondent noted:

There should be essentially no barriers to accessing the course material. All students should have required course material from the very start of class. Anything less than that compromises their chance for success and that, in terms, compromises the overall course environment. OERs remove the primary impediment to student access to the material.

Other respondents were more neutral or conflicted in their evaluation of OERs as opposed to commercial texts. One instructor acknowledged the reduction to student cost inherent in open education but remarked on the added time and expense needed to support faculty/instructors who review, create, and customize materials. Overall, while many agreed that OERs could be beneficial, some commented that commercial textbooks are a superior choice for certain topics and additionally can serve as a reference after graduation.

In our last open-ended question, we asked survey participants to indicate concerns they have with using OERs in a course (see Figure 8).

<b>Figure 8: What concerns, if any, do you have with using open educational resources in your classes?</b>		
	Frequency	Relative Frequency (%)
Quality	6	27.3
Lack of content control	2	9.1
Limited discipline resources	2	9.1
Access	1	4.5
Copyright	1	4.5
None	4	18.2
No response	6	27.3

One full professor indicated no concerns, suggesting that an individual evaluation of course material is more important than the authority of the author writing the materials. On the other hand, several faculty members pointed to a lack of quality in OERs authored for their specialized areas of teaching. Other concerns included limitations in student Internet/computer access, student inability to evaluate sources, problems with copyright/intellectual property, and lack of control over the content.

In expressing concerns, one faculty member cited more of a benefit of OERs, returning to the idea of providing students with an alternative perspective on the course topic. This respondent noted:

I often use an OER that is more theoretical than what [is] present in class to encourage the class's top performers to learn more. On the other hand, I often find OER materials that cover pre-requisite material so that students who are behind can get caught up without having to spend office hours with just those few students.

## Interviews

To supplement survey responses, we also conducted interviews with select faculty members and instructors who teach large intermediate engineering courses. To identify the faculty and instructors for interviews, we met with the Associate Dean of Undergraduate Education in the College of Engineering to talk about the overall use of OERs in engineering and to select courses where OERs might be a viable option. We then selected interview questions that inquired about faculty members' and instructors' teaching experience, their criteria for selecting textbooks, and their potential interest in using OERs (Appendix B). Ultimately, we reached four faculty or instructors whose average instruction experience ranged from four to 16 years. The interviewees included three female and one male. The interviewees included two clinical assistant professors,

one associate professor, and one professor. Of the four interviewees, two were from the School of Mechanical and Materials Engineering, one from Civil and Environmental Engineering, and one from Electrical Engineering and Computer Science. All participants had at least one course that requires a textbook. When analyzing the interview questions we were looking for commonalities between responses.

To better understand the process of course material selection, we first asked instructors and faculty to talk about the criteria they use when choosing textbooks. Interviewees indicated that they prioritize textbook relevance, industry standards, or the recommendations of course coordinators and curriculum committees when making selections. When asked if they had received any guidance on the selection of textbooks, two interviewees indicated that they received advice from someone with teaching experience or a department chair, and another referred to course coordinators or curriculum committees. The trend when considering materials for a course was overwhelmingly the relevance to the course.

We asked interviewees next to describe what they liked and disliked about their current texts. Regarding what they currently liked, some interviewees noted that their current texts are easy for students to understand and provide interactive features. However, other responses were quite lukewarm on the subject. For instance, one interviewee remarked, “[My current textbook] is probably the least bad introduction book.” Continuing in a negative vein, other interviewees commented on the lack of practice problems in their current texts, lack of real-world examples, and factual errors in the text. Only one interviewee indicated the cost of the textbook as a dislike. The commonality between faculty and instructors was the desire for consistency in the materials content and potential features.

We concluded interviews by asking faculty and instructors to describe student feedback to the texts currently used in their courses. We also asked if the interviewees had ever considered using OERs in a course. As anticipated, interviewees reported that some students had complained about the cost of textbooks; however, nobody recalled remarks from students about the cost savings provided by OERs. Two interviewees indicated no student feedback about texts or, alternatively, positive feedback. Finally, when asked if they would consider using an OER in a course, only one instructor reported having experience using an open text while the other interviewees did not. Although some indicated that they would not use an OER for class, others expressed interest in learning more about open education. The trend through seemed to be that while there was some knowledge of OERs all expressed interest in learning about OERs in general and the potential availability.

### Best Practices and Implementation

Through the survey and the interviews with faculty and instructors, we have developed best practices for OER outreach and a plan for implementation of OERs in discipline-specific fields (Box 1). Many of these recommendations are mere extensions of the practices that have been posited for embedded and liaison libraries, applying collaborative and outreach strategies to emerging trends in education. These recommendations also seek to further the practices presented in ACRL’s white paper on the intersections of scholarly communication and library instruction.

For liaison librarians making outreach plans, we would recommend that they begin by reviewing available OERs for the discipline in question. Some disciplines are far better represented in the corpus of open educational resources, and instructors in those areas may be more receptive to the idea of open education because they can see concrete examples in practice. Where OERs are not available, liaison librarians may want to initiate a conversation with department administrators about possibilities for developing resources programmatically, perhaps with the support of a course fee. For instructors who are dissatisfied with available commercial texts, this option may well be appealing. As these conversations progress, we recommend learning the basics of the department's curriculum decision-making process. Some faculty members defer to curriculum committees when it comes to textbook selection while others by convention make their own decisions. The process of identifying and vetting appropriate texts will be quite different in these two environments. We recommend taking a read on the landscape before proceeding with any OER development initiative.

Following discussions with departmental administrators and curriculum coordinators, we would advise speaking to faculty and instructors about their experiences with course materials. Ultimately, we would caution liaison librarians to not rely too heavily on support from administration to carry OERs into courses. Despite departmental practices at the global level, individual faculty members negotiate with publishers, interact with students, and make course material selections. Their voice is absolutely crucial to any landscape analysis.

Although surveys can be over-used, we found that a survey/interview process helped us to better identify the issues at hand for engineering instructors and faculty members. For instance, we learned through conversations with teaching faculty and instructors that everyone's understanding of open education varied widely. Some instructors expressed confusion about basic concepts in open education that the libraries could help clarify, while others had deeper concerns related to quality, sustainability, and availability of resources. A reasonable starting point for libraries interested in OER outreach is to address basic questions about open education while identifying needs that can currently be filled at the university (for instance, by referring the instructor to the university's team of instructional designers to assist in developing interactive OERs that could support current texts). In this process, we recommend cultivating a wide network of partnerships, between libraries, instructional design, curriculum committees/coordinators, administrators, and experts in copyright and intellectual property.

Another common thread throughout our surveys and interviews was the value of OERs when used as resources to supplement commercial texts. Instructors indicated that these resources provide advantages to students who are looking for alternative explanations of topics and for those who cannot access textbooks on the first day of class. Based on this feedback, we would recommend promoting OERs as supplementary material even in cases where they cannot satisfy the instructor's primary needs. Supplementary OERs allow instructors to gain experience with open education while providing advantages for students in need of course material that is easily and consistently accessible.

Finally, concerning implementation of OERs, we recommend working one-on-one with instructors to identify needs and an appropriate plan for individual courses. Some instructors may

be interested in exploring open education, either by recommending a supplemental open text or by reviewing an existing OER. Others may wish to develop an OER from scratch, while still others may be interested in adapting or remixing existing resources. These different project types can only be explored and pursued through extensive conversations between instructors, administrators, and support staff on campus. In this process, we would encourage libraries to work with others to find and support existing advocates of open education. By determining what is working well for these instructors and supporting them in their work, the university can learn how to replicate success stories for other instructors and students.

### **Box 1: Best Practices for Discipline-Specific OER Outreach**

Review available OERs in the discipline

Pursue instruction opportunities if knowledge regarding OERs is limited

Understand departmental practices for the adoption of course materials

Develop strong partnerships with instructional designers, curriculum coordinators, and experts in copyright/intellectual property

Speak to instructors about course material needs, maintaining focus on student success

Recommend OERs as supplemental resources if course-material needs cannot be otherwise filled with open content

### Conclusions

Our recommendations reinforce the notion that one size does not fit all when it comes to open education. In a small way, we hope this paper furthers discussion about how libraries can support open education in specialized disciplines, highlighting strategies liaison librarians can pursue to uncover and fill the needs of faculty members related to course materials. We found surveys, interviews, and discussion with curriculum coordinators to be a useful start in developing a clearer understanding of particular pedagogical needs in the College of Engineering and would encourage other librarians to make use of these strategies as well. This work of collaborating with faculty members will almost certainly further recommendations by ACRL for embedding scholarly communication in the instruction and outreach work of librarians, while also bringing to light other perspectives on OERs in specialized disciplines. We look forward to continuing our work with the College of Engineering with an eye to opportunities for advancing open pedagogy.

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## Appendix A: Survey

### Consent Form

Study Title: Open Educational Engineering Resources: Adoption and Development by Faculty and Instructors

#### Purpose of the Study

The purpose of this interview is to collect information from engineering faculty and instructors involving the possible use of open educational resources in engineering courses. Data collected will provide best practices when approaching and integrating open education resources into engineering courses. You are being asked to participate because of your interest or participation in teaching.

What will I do if I choose to be in this study?

You will be asked to answer questions related to the teaching and open educational resources. Your responses will be recorded and stored on a server.

How long will I be in the study?

The duration of participation is approximately 30 minutes.

What are the potential risks and benefits?

There are minimal risks associated with participation in this project. The risks are no greater than the participant would encounter in daily life or during the performance of routine physical or psychological exams or tests. However, the breach of confidentiality is a risk common to this type of research projects. All effort will be used to maintain confidentiality as outlined below. There are no direct benefits to you. However, the field, and specifically engineering and engineering education programs at the university, my benefit from the results.

Will information about me and my participation be kept confidential?

All effort will be used to maintain confidentiality. The project's research records may be reviewed by departments at the university responsible for regulatory and research oversight. You will not be asked any sensitive questions. All data collected will be stored in a locked office in a locked file cabinet, or on a secure, password protected network using a file naming system that does not include any identifiable information. Only the researchers will have access to the data. Identifiable information will not be kept along with the data.

What are my rights if I take part in the study?

Your participation in this study is voluntary. You may choose not to participate or, if you agree to participate, you can withdraw your participation at any time without penalty or loss of benefits to which you are otherwise entitled.

Who can I contact if I have questions about the study?

If you have question, comments or concerns about the research project, you can talk to one of the researchers.

If you have questions about your rights while taking part in the study or have concerns about the treatment of research participants, please call the Institutional Review Board.

#### Research Study Exempt Status

The Common Rule codified in 45 CFR 46.101(b) specifies that research activities may be classified as exempt in the policy if human subjects involvement is limited to one of the listed scenarios, including studies involving the collection or study of existing data when those data either are publicly available or are not personally identifiable.

#### Documentation of Informed Consent

I have had the opportunity to read this consent form and have the research study explained. I have had the opportunity to ask questions about the research study, and my questions have been answered. I am prepared to participate in the research study described above. I will be offered a copy of this consent form after I sign it.

Thank you again. By clicking "Agree" you are acknowledging the potential risks above.

- AGREE
- DISAGREE (form will submit without showing questions)

#### Survey Questions

1. What is your age group?

- a. 20-24
- b. 25-29
- c. 30-39
- d. 40-49
- e. 50+

2. Gender identity

- a. Male
- b. Female
- c. Choose not to identify

3. Department

4. Title/Rank

Open educational resources (OERs) are any type of educational material that is in the public domain or distributed under an open license such as Creative Commons. These materials are "open," meaning that anyone can legally and freely copy, use, adapt, and re-share them. (See UNESCO's definition of OERs here: <http://www.unesco.org/new/en/communication-and-information/access-to-knowledge/open-educational-resources/what-are-open-educational-resources-oers/>).

5. Are you familiar with open educational resources (OERs)?

- a. Yes, I have heard of them but know very little about them
- b. Yes, I have searched for them and perused a few

- c. Yes, I have used open educational resources in one or more classes
  - d. No, I have never heard of them until today
6. If you have considered open educational resources, when was the last time you used/examined them?
- a. This semester
  - b. Last semester
  - c. 1-2 years ago
  - d. 3-5 years ago
  - e. 5-10 years ago
  - f. Never
7. If you have used OERs in an engineering course, how did your students respond to the material?
- a. [open response]
8. If you have evaluated OERs in the past, what is your perception of their quality and suitability for engineering students at WSU?
- a. [open response]
9. What benefits do you see for using open educational resources rather than commercial textbooks?
- a. [open response]
10. What concerns, if any, do you have with using open educational resources in your classes?
- a. [open response]

## Appendix B: Interview

### Consent Form

Study Title: Open Educational Engineering Resources: Adoption and Development by Faculty and Instructors

#### Purpose of the Study

The purpose of this interview is to collect information from engineering faculty and instructors involving the possible use of open educational resources in engineering courses. Data collected will provide best practices when approaching and integrating open education resources into engineering courses. You are being asked to participate because of your interest or participation in teaching.

What will I do if I choose to be in this study?

You will be asked to answer questions related to the teaching and open educational resources. Your responses will be recorded and stored on a server.

How long will I be in the study?

The duration of participation is approximately 30 minutes.

What are the potential risks and benefits?

There are minimal risks associated with participation in this project. The risks are no greater than the participant would encounter in daily life or during the performance of routine physical or psychological exams or tests. However, the breach of confidentiality is a risk common to this type of research projects. All effort will be used to maintain confidentiality as outlined below. There are no direct benefits to you. However, the field, and specifically engineering and engineering education programs at the university, may benefit from the results.

Will information about me and my participation be kept confidential?

All effort will be used to maintain confidentiality. The project's research records may be reviewed by departments at the University responsible for regulatory and research oversight. You will not be asked any sensitive questions. All data collected will be stored in a locked office in a locked file cabinet, or on a secure, password protected network using a file naming system that does not include any identifiable information. Only the researchers will have access to the data. Identifiable information will not be kept along with the data.

What are my rights if I take part in the study?

Your participation in this study is voluntary. You may choose not to participate or, if you agree to participate, you can withdraw your participation at any time without penalty or loss of benefits to which you are otherwise entitled.

Who can I contact if I have questions about the study?

If you have question, comments or concerns about the research project, you can talk to one of the researchers. If you have questions about your rights while taking part in the study or have concerns about the treatment of research participants, please call the Institutional Review Board.

### Research Study Exempt Status

The Common Rule codified in 45 CFR 46.101(b) specifies that research activities may be classified as exempt in the policy if human subjects involvement is limited to one of the listed scenarios, including studies involving the collection or study of existing data when those data either are publicly available or are not personally identifiable.

### Documentation of Informed Consent

I have had the opportunity to read this consent form and have the research study explained. I have had the opportunity to ask questions about the research study, and my questions have been answered. I am prepared to participate in the research study described above. I will be offered a copy of this consent form after I sign it.

\_\_\_\_\_  
Participant's Signature \_\_\_\_\_  
Date

\_\_\_\_\_  
Participant's Printed Name

\_\_\_\_\_  
Researcher's Name \_\_\_\_\_  
Date

### Interview Questions

Department:

Title/Rank:

What is your age group (circle one)?

- a. 20-24
- b. 25-29
- c. 30-39
- d. 40-49
- e. 50+

### TEACHING

1. How long have you been teaching?
2. How long have you been teaching at this university?
3. What courses are you teaching this semester?
4. How many of those courses have a textbook?

### ABOUT TEXTBOOKS

1. How did you select your textbooks?
2. Did you receive guidance from anyone about textbook selection? (i.e. a librarian, colleague, department head, etc.)
3. What do you like about your textbooks?

4. What do you dislike about your textbooks?
5. What do your students say about your textbooks?
6. Have you ever considered using open educational materials? If so, describe your experience.