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Abstract

Textbook costs in United State post-secondary education have dramatically increased since the 1970s. Open educational resources (OER) have been proposed to significantly lower or eliminate textbook costs and provide faculty options in selecting current and individualized course materials. OER adoption by faculty across the United State post-secondary educational system has been uneven and complex. This study sought to understand faculty perceptions of OER adoption within the Wyoming public higher education system. Specifically, this study investigated the current level of adoption, perceived benefits of OER adoption, and perceived barriers of OER adoption.

This study utilized a quantitative survey design which was conducted at six Wyoming higher education institutions in the 2021-2022 academic year. The analysis of the data revealed significant OER awareness by faculty; however, OER use was underutilized. Discoverability and quality of OER were the top four perceived barriers for OER. The top three rated benefits of OER adoption were student-facing: cost, first day access, and the same or better student performance. The highest rated faculty-facing benefit was not having to switch textbook editions on a commercial publisher schedule. Based on the findings, implications for OER adoption by faculty, institutions, and Wyoming public higher are discussed.

**Faculty Perception of Adopting Open Educational Resources in Wyoming Public Higher
Education**

By

John M Raible

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in

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Chapter One: Introduction

A post-secondary education has been long touted as the key to a lifetime of financial security through gainful employment. The lifelong earnings potential can be restricted for individual with a high school diploma versus an individual with a postsecondary education in the United States. From 2000 to 2019, a full-time worker with a high-school diploma has earned on average 85% of a worker with some college or an associate degree. This figure drops to 58% when comparing a full-time worker with a high school diploma to a worker with a bachelor's degree (Bureau of Labor Statistics, 2019).

The cost of a post-secondary education has been a concern in the 21st century and a significant barrier to attendance for many potential students. According to a 2019-2020 report by the United States Federal Reserve (2021), 40% of college attendees have debt for their post-secondary education and with the average balance being between \$20,000 and \$24,999. United States federal law requires post-secondary institutions to calculate and publicly disclose the cost of attendance (20 U.S. Code § 108711). The major elements used in the cost of attendance calculation: tuition and fees, room and board, books, supplies, transportation, and miscellaneous expenses. The College Board (2020) reports full time students at two-year public post-secondary institutions spend \$1460 dollars per academic year on books and supplies while students at four-year public post-secondary institutions spend \$1260 dollars per academic year on books and supplies. While systematic change in the funding of public higher education is needed, immediate action can be taken to address one segment of the cost of attendance, textbooks. The adoption of open educational resources (OER) in place of students' purchase or rental of expensive textbooks is one way to reduce the cost of books and supplies.

In this chapter, the background for the study will describe how textbook and course materials cost have risen dramatically and greatly added to the cost of a post-secondary education. OER can be a solution to lower the cost of course materials; however, the lack of planning and resources can negatively impact OER adoption. The purpose of this study is to examine faculty perception of OER adoption in Wyoming public higher education. It is significant to conduct a study in this area as there is a lack of information available for the proposed context. The research questions will involve discovering faculty perceptions of OER adoption, perceived benefits, and barriers.

Background

A significant cost component of a post-secondary education is the purchasing of textbooks. According to the United States Government Accountability Office (GAO), the price of textbooks rose at three times the rate of inflation between 2002 and 2012 (United States Government Accounting Office, 2013). The U.S. Bureau of Labor Statistics reported that the price of college textbooks has increased 88% since 2006 and is rising faster rate than tuition and fees (United States Bureau of Labor Statistics, 2016). A 2018 survey of 24,000 university and community college students found that 64% of students did not purchase the required textbook, 43% took fewer courses, and 36% earned a poor grade due to the lack of a textbook (Florida Virtual Campus, 2019). A report by Senack and the Student PIRGs (2014) surveyed over 2000 students in 150 United States colleges and universities found similar numbers: 65% of students did not buy a textbook for one or more of their courses because of cost. Forty-eight percent indicated that the cost of textbooks had somewhat or significantly affected the selection or the number of courses they were able to take each semester. Textbook cost is having a direct

negative impact to student performance in the post-secondary education setting (Anderson & Cuttler, 2020).

A review of U.S. Department of Education’s Integrated Postsecondary Education Data System (IPEDS) at the National Center for Education Statistics (2021) for each public higher education institution in Wyoming yield the results listed in Table 1. The data is comparable to the national averages listed by the College Board (2020). Four institutions are below national averages while four institutions are above national averages. The percentage of undergraduate students receiving financial aid is also included. Significant adoption of OERs at each institution can make an impact on this data.

Table 1

IPEDS 2020-2021 Data on Books and Supplies in Wyoming and 2019-2020 Financial Aid

Institution	Cost of Books and Supplies in 2020-2021 Academic Year	Percentage of Undergraduate Students Receiving Financial Aid for 2019-2020 Academic Year
University of Wyoming	\$1,200	76%
Casper College	\$1,200	55%
Central Wyoming College	\$1,200	46%
Eastern Wyoming College	\$1,500	37%
Laramie County Community College	\$1,200	47%

Northern Wyoming Community College District	\$1,400	47%
Northwest College	\$1,500	59%
Western Wyoming Community College	\$1,600	36%

Statement of Problem

Cost is a significant barrier to student purchasing required textbooks and OER can be one solution to dramatically lower student costs (Wiley & Hilton, 2018). Wyoming public higher education students struggle with acquiring necessities such as food. Elder (2018) reports nearly one third of University of Wyoming students report they are food insecure, a metric used by the United State Department of Agriculture to describe the stress of knowing if a person will have enough food daily. The University of Wyoming acknowledges the issue of food insecurity and has setup a taskforce to assist students to address food insecurity (University of Wyoming, 2020). Other institutions in Wyoming report their students struggle with food insecurity. Western Wyoming Community College’s student government organization recently set up the Student Storehouse, an on-campus food pantry (Wyo4News, 2020). At least two other Wyoming public higher education institutions have existing on campus food pantries. A Wyoming public higher education student should not have to choose between food and purchasing textbooks.

In Wyoming, OER adoption efforts are coordinated through the Open Range project. The goal of the Open Range project is to provide an environment for developing and hosting OER created by Wyoming educators. Resources provided include a free professional development course and dedicated space on an OER sharing platform on OER Commons. The professional

development course contains six modules and focuses on the following topics: understanding OER, accessibility, teaching with OER, copyright and fair use, finding and creating OER, and evaluating resources. Completers of the professional development course are issued a digital badge and promoted on Open Range as “OER Rock Stars.” Currently, twenty- five K-12 education teachers are highlighted (Open Range Wyoming, n.d.).

OER Commons is a public digital library and collaboration platform which allows anyone to submit or create OER (OER Commons, n.d.). Open Range Wyoming is a microsite on the OER commons platform meaning only invited members can submit OER to the microsite while anyone can view only. Every resource being including in this collection has been curated to ensure the material aligns with Wyoming Department of Education curriculum. A review of the Open Range Wyoming on OER commons yield the number of resources in table 2. Of the 4,122 OERs examined, only 68 (.01%) were labeled for use in higher education.

Table 2

Wyoming OER Collections in Open Range Wyoming on OER Commons

Wyoming OER Hub	Number of Resources
Computer Science WY	47
CTE	21
English Language Arts	1,202
Fine Arts	35
Health	9
Indian Education for All	14
Mathematics	603

Science	2,009
Social Studies	37
World Languages	1
WDE Vetted Content	102
Wyoming PBS	42
Total	4,122

Current Open Range Wyoming efforts are focused on K-12 education with extremely limited participation by Wyoming public higher education. No formal data collection has been completed to understand why participation is so limited. Anecdotal information suggests faculty struggle with OER awareness, copyright, and understanding open licenses such as Creative Commons. Further exploration of faculty OER perceptions will be extremely useful to assist in future development of OER outreach and training programs specifically targeted at Wyoming public higher education (D. Brown, personal communication, April 12, 2021).

Purpose of the Study

Faculty at post-secondary institutions may control or influence materials for their courses depending on their status at the institution. A selection of OER instead of a traditional textbook can come with cost savings benefits, immediate access to course materials and the potential increase of student academic achievement. (Wiley & Hilton, 2018). There are, however, barriers to overcome. Concerns over lack of familiarity with OER, availability of OER in their discipline, and the additional immediate time and effort required to adapt the materials to their courses (Allen & Seaman, 2014). Faculty may not have the current capacity to redesign courses without additional incentives and resources. Understanding an institution's culture, faculty awareness,

discoverability, and creating the appropriate amount and/or variety of incentives can increase the adoption of OER by higher education faculty.

Research Questions

This study will examine the following questions regarding factors influencing the faculty adoption of OER in Wyoming public higher education institutions.

1. What is the current adoption level of OER?
2. What are perceived barriers to OER adoption?
3. What are the perceived benefits to OER adoption?

Significance of the Study

Faculty who adopt OER instead of a commercial textbook improve withdraw rates and observe no impact on course performance (Anderson & Cuttler, 2020; Belikov & Bodily, 2016; Hilton, 2020). Despite these benefits, faculty may be unaware of OER or face other challenges or barriers to OER adoption (Fischer et al., 2020; Martin et al., 2017). This study seeks to create baseline knowledge about faculty perception of OER in Wyoming public higher education. The results may benefit numerous groups in Wyoming, such as university leadership and instructional design and professional development professionals. Faculty may learn about OER for the first time while participating in this study or reflect on why they do not adopt OER. Leaders at both the institutional level and state-wide system level can understand the current level of OER adoption and the perceived benefits and barriers by their faculty. Resources can be strategically allocated to promote OER adoption. Students may gain more access to a high-quality educational experience.

Delimitations

This study has several delimitations. No students will be included, even if they are an instructor of record for a course (e.g., a graduate teaching assistant). Faculty will not be asked OER details such as the author, distribution method (print v. digital), or how the OER was acquired. OER creation will not be addressed in this study. This study will not include private higher education institutions in Wyoming. Due to the limited sample size, results from this study may not be generalizable to other public higher education systems in the United States.

Definitions

This section contains definitions which will be used throughout this study. Definitions will be used directly from organization which created the definition. Non-cited definitions are created specifically for use in this study.

Creative Commons License

A creative commons license is “a standardized way to grant the public permission to use their creative work under copyright law” (Creative Commons, n.d.).

Faculty

An individual who is the primary instructor of record for an academic course.

Open Educational Resources (OER)

OER is a “teaching, learning and research materials in any medium – digital or otherwise – that reside in the public domain or have been released under an open license that permits no-cost access, use, adaptation and redistribution by others with no or limited restrictions” (United Nations Educational, Scientific, and Cultural Organization, 2019).

OER Adoption

OER adoption is the process of replacing of a commercial textbook with OER to use in an academic course setting.

OER Creation

OER creation is the process of releasing academic content to the public under an open license such as a creative commons license.

Public Domain

The public domain is a “creative materials that are not protected by intellectual property laws such as copyright, trademark, or patent laws” (Stanford University Libraries, 2021).

Summary

A post-secondary education is important to maximize future wage earnings yet can come at a significant financial commitment. Most costs are fixed by the institution or state governing body. One element of a student’s cost of education that could be influenced by faculty is textbooks costs. High costs for textbooks force students to delay or not purchase required textbooks causing direct harm to their academic performance. Faculty may ease student textbook costs by replacing commercial textbooks with OER as the primary source of academic content in their courses. This is a complex issue which considers a faculty member’s knowledge about OER, their academic role in an institution, and the institutional culture. A review of literature will explore these complex issues in depth to provide a more detailed understand of faculty’s perception to OER adoption.

Chapter Two: Review of the Literature

Chapter one described the issue of textbook costs for students in post-secondary education. The adoption of open educational resources OER by faculty is an option to lower textbook costs and provide more pedagogical options. The literature reviewed pertaining to OER adoption developed themes in the following areas: faculty awareness, types of incentives, and funding. Faculty awareness addresses the general unfamiliarity faculty have with OER adoption. Types of incentives range from direct compensation to resources provided by the university. Funding refers to the investment of financial support by the institution, external funding from agencies or grants, and government support.

Faculty Awareness

OER awareness among post-secondary faculty has been increasing in the United States. Morris-Babb and Henderson (2012) discovered in a survey of 2,707 faculty members and administrators of colleges and universities that only 7% of that group were very familiar with OER textbooks, while 52% were not at all familiar with OER textbooks. Allen and Seaman (2014) in their nationally representative survey of 2,144 faculty members in the United States found that only 34% of respondents expressed awareness of OER. Allen and Seaman (2016) conducted a follow up study of 3,000 faculty members and asked the same question about faculty awareness. The results yielded an increase to 42% of respondents who expressed awareness of OER (Allen & Seaman, 2016). Spilovoy et al. (2020) surveyed faculty about OER awareness from institutions represented by four higher education compacts, representing potentially all 50 states, the District of Columbia and United States territories. Forty-four percent of faculty were categorized as aware of OER (Spilovoy et al., 2020). A report by James et al. (2021) surveyed 110 public higher education institutions in Texas found 73% of institutions

promoted OER adoption efforts through faculty trainings and professional learning opportunities; however, only 10% of faculty report attending such events. Even with incremental gains of faculty OER awareness, most faculty have yet to be introduced to the idea of OER (Wiley et al., 2017).

Seaman and Seaman (2017) reported 50% of 2700 respondents identified difficulty of finding OER as a key barrier to adoption. OER repositories such as MERLOT and OER Commons were developed to assist with the storage, collection, and discovery of OER yet issues remain with the metadata attached to individual OER (Anderson & Leachman, 2019). As more and more repositories are created, there is a need to develop methods to broaden discoverability and promote faculty awareness of existing materials. Two examples of tools are the Mason OER Metafinder and the State University of New York (SUNY) OASIS. Each tool indexes OER from multiple sources and provides users an option to filter by title, author, subject, source, and date (Anderson & Leachman, 2019; Stafford & Flatley, 2020). Other options for discovery are institutionally specific and will be discussed in the next section.

Types of Incentives

Early incentives for faculty OER adoption or creation did not include compensation. Browne et al. (2010) found institutions appealed to altruism and raising an individual's academic profile to adopt OER instead of using direct compensation. While noble motives were presented by an institution, faculty were not ready to take on additional duties without further compensation or institutional recognition. Career advancement through promotion and tenure did not include incentives for using OER and the non-inclusion will not promote the case for using OER (Olcott, 2012). Hassall and Lewis (2017) found 40% of respondents had little or no institutional support.

Monetary payment for faculty varies across post-secondary institutions in the United States. OER programs typically provided a one-time direct monetary payment to faculty in a tiered system: reviewing, adopting, adapting, or creating. Adopting an OER replacement for a textbook with minor revisions or adjustments ranges from 1000 to 1500 dollars. (2019-21 OER Grants Awarded, 2019; Textbook Transformation Grants, n.d.; Schmidt, n.d.). Further empirical research is needed in this area to capture monetary practices across the United States.

An obstacle to increasing OER adoption is the lack of time to have achieved faculty buy-in (Avila & Wray, 2018). Faculty needed time away from their current professional responsibilities, administrative duties, research, teaching, and service. Faculty stated that they would willing to use OER in their courses, yet the current time was not adequate to properly evaluate or adopt the resources (Belikov & Bodily, 2016). A common method used to clear faculty time is to buy it through a course release. Funds provided to departments allowed faculty to reduce teaching, research, or administrative loads to concentrate on adopting or creating OER. In addition, faculty reported they have spent more time preparing when OERs are used as textbooks (Bliss et al., 2013). The increase in preparation is due to updating content, ensuring student access through a learning management system or other platform, and notification to students of an OER.

Institutions have invested in dedicated personnel such as OER librarians that aid faculty in the adoption or creation of OER (Avila & Wray, 2018; Fischer et al., 2020). This type of specialized resource is a newer type of non-compensation incentive available to faculty. In addition, libraries and OER librarians are found to lead many institution wide OER initiatives. Numerous services provided by OER librarians included creation of specific discipline resources,

review of course syllabus to find suitable open content, copyright and licensing assistance, and professional development opportunities (Avila & Wray, 2018; Colson et al., 2017; Salem, 2017).

Funding incentives can prove difficult. Linsheifl and Adhikai (2013) proposed utilizing a course fee model for providing OER incentive funding. Instead of requiring students to purchase course materials, a flat fee was charged for each student. This fee supported faculty incentives such as course releases and monetary payments.

Numerous state governments have provided funding through legislative appropriations. The Scholarly Publishing and Academic Resources Coalition (SPARC) reports eight states across the United States have current state appropriations to fund OER adoption (SPARC, 2021). An example is the state of Georgia created the Affordable Learning Georgia organization in 2014 to manage textbook transformation grants for faculty (Croteau, 2017). Another example is in Texas, where 29% of public higher education institutions received state funding in 2021 for OER activities. In 2019, only 5% of public higher education institutions reported receiving state funding for OER activity (James et al., 2021). The state of California has allocated 115 million dollars for the 2022-2023 fiscal year to increase their zero textbook cost program for California Community Colleges (Smalley, 2022). This is the largest investment in OER from a state. In comparison, New York state has allocated 4 million dollars for OER (Smalley, 2022). United States Federal Government issued a proposal for five million dollars in the 2018-2019 fiscal year; marking the first time the federal government has incentivized OER. All the appropriation went to one proposal to expand the LibreText program out of the University of California Davis (Lieberman, 2018). The open textbook pilot was continued on a year-to-year basis with support from the United States Congress although a permanent legislation has been proposed but has not become law (SPARC, n.d.). In 2022, The Affordable College Textbook Act was reintroduced

with the goal of providing more funding to enhance the transition from commercial textbooks to OER (SPARC, 2022). The increased interest in OER from the government still does not provide enough funding to incentivize OER at every public institution.

Despite the infusion of money at the federal or state level, institutions find themselves responsible for funding incentives. Locating a source of funding can be difficult. Within the institution, organizations such as libraries, faculty centers, or distance learning centers seek funding from Provost or Chief Academic Officer level of the administration (Mordhorst, 2019; OER Funding Application, 2019; 2019 OER Support Grants, 2019). The University of South Florida implemented the Textbook Affordability Project. While the library was in charge of planning and implementing, funding was provided from the Office of Provost and the Innovation Education office (Metz-Wiseman, 2016). The goal of the project was to acquire e-Textbooks for the classroom while promoting the adoption or creation of OER (Boczar & Pascual, 2017). This type of strategic partnership across the institutions highlights the importance of creative funding for OER initiatives.

Attitudes and Quality

Faculty are concerned about the quality of available OER compared to commercial textbooks. Allen and Seaman (2014) found faculty who are in the position to select a commercial textbook felt concerned about proven efficacy and trusted quality. Further research conducted by Allen and Seaman (2016, 2017) confirm quality and keeping materials current as the third and fourth barriers to OER adoption behind discoverability and time to review materials. However, Allen and Seaman's (2014, 2016, 2017) research discovered that 75% of faculty that adopted OER rank quality the same or better than comparable commercial textbooks. There is a significant difference in quality perception between OER adopters and non-adopters. Studies

conducted by Jhangiani et al. (2016) and Jung et al. (2017) corroborate findings of Allen and Seaman (2014, 2016, 2017). Jhangiani et al. (2016) found 59% of faculty rated OER quality as comparable, slightly better or significantly better than commercial textbooks. When asking those faculty who have adopted OER previously, 80% of faculty rated OER quality as comparable, slightly better or significantly better than commercial textbooks (Jhangiani et al., 2016). Jung et al. (2017) surveyed faculty who adopted OER from Openstax. Sixty-two percent responded OER from Openstax was the same quality as commercial textbooks while 19% perceived OER quality was higher than commercial textbooks. Faculty who adopt OER find comparable or better quality to the commercial textbook counterparts.

Rubrics are one of the tools available to assist determining OER quality for faculty adoption. A rubric provides a scoring scheme and explicit evaluation criteria to judge a product or activity (Moskal, 2000; Dickinson & Adams, 2017). In an OER context, Yuan and Recker (2015) developed a framework to determine the quality of rubrics examining the quality of OER. Three specific characteristics were identified: specific content, a rubric development process, and application context. Content addresses on how the rubric deconstructs overall OER quality and which measures are utilized to determine quality. A rubric development process details any empirical testing results and documents any changes or improvements made to a rubric. The application context demonstrates if the rubric can be used on any OER or specific to a certain type of OER such as a website, eBook, or documents. Yuan and Recker (2015) examined OER rubrics under this framework and found a complex picture where the majority of rubrics did not meet all three criteria with other rubrics meeting partial criteria. A follow-up study by Yuan and Recker (2018) examined how instructional and non-instructional individuals apply and utilize quality OER rubrics. Overall, both groups found OER rubrics to be useful and helpful in

examining OER quality even though their preferences for quality rubrics and indicators differed. Many rubrics exist to evaluate OER; however, there is not consensus on how to define or evaluate quality OER.

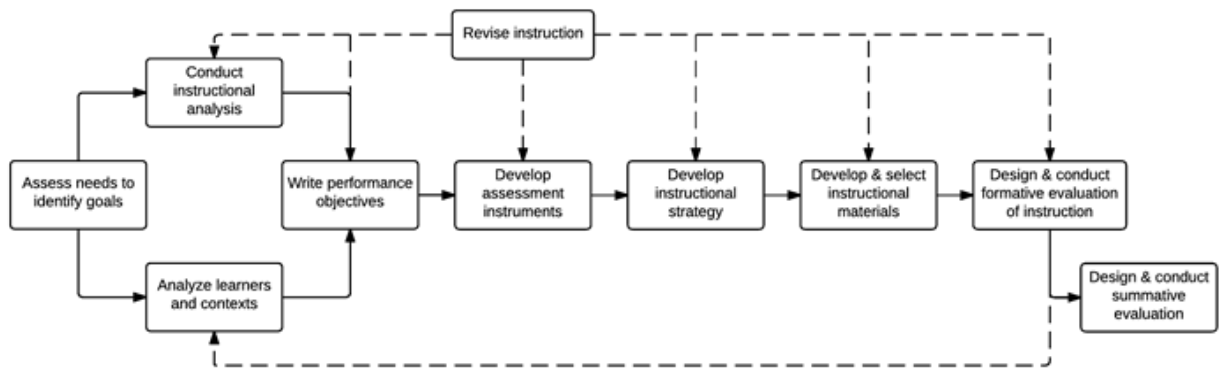
Instructional Designers

Instructional designers can be a valuable resource to assist higher education faculty in OER adoption. Ren (2019) contends instructional designers are experts in the field of instructional strategies, course development, and implement course materials to better solve instructional problems. Individual tasks and projects vary greatly depending the on the role of instructional designer at the institution along with level of faculty engagement (Kumar & Ritzhaupt, 2017; Magruder, Edwards, & Moore, 2019). Regardless of an instructional designer's role, the field of instruction design provides multiple theoretical approaches or models to assist faculty infuse OER in their courses. Branch and Dousay (2015) describe the importance of using instructional design models as a communication tool that can assist in visualizing, directing, and managing all the processes needed to create instruction which also include the selection of tools, technologies, and resources required to complete the task. Each model varies greatly in the purpose, amount of detail, quality, and utility (Branch & Dousay, 2015). Popular instructional design models include ADDIE, Backward Design, Bloom's Taxonomy, Dick & Carey, SAMR, and TPACK (Khalil & Elkhider, 2017; Bond & Dirkin, 2020). Any of the aforementioned instructional design models can be utilized to infuse OER into a course; however, the systems approach developed originally by Dick & Carey, later added James Carey in subsequent updates, provides the most detail and utility for designing or redesigning a course to utilize existing OER content.

Dick, Carey, and Carey (2009) created a systems approach which is described as “a set of interrelated parts all which work together toward a defined goal...that depend on each other for input and output” (p.1). Figure 1 shows an overview of the entire Dick, Carey, and Carey model.

Figure 1

Dick, Carey, and Carey Instructional Design Model



Of particular interest to instructional designers who assist faculty with OER adoption is the Develop and Select Instructional Materials process. Dick, Carey, and Carey use the broad term “instructional materials” as encompassing for all materials related to instruction which include textbooks, print and digital files, and media in a course context. This framing provides instructional designers and faculty the maximum flexibility to consider how OER adoption will be applied to their course. Dick, Carey, and Carey provide several considerations on how to evaluate existing materials to ensure alignment with learning objectives and instructional strategies. Used in conjunction with existing OER quality rubrics, Dick, Carey, and Carey’s criteria can further assist with the proper selection of OER materials for a course.

Table 3

Dick, Carey, and Carey Criteria for Evaluating Existing Materials

Types of Criteria	Description
-------------------	-------------

Goal Centered Criteria	Congruence between objectives, adequacy of coverage, authority, accuracy, currency, and objectivity
Learner Center Criteria	Vocabulary level, motivation, experiences, special language
Learning Centered Criteria	Pre-instructional materials, content sequencing, student practice exercises, feedback, assessments, follow through directions, guidance on moving onto next sequence
Context Centered Criteria	Authenticity and feasibility
Technical Criteria	Delivery system and media format, packaging, graphic design, durability, legibility, audio/video quality, interface design and usability.

Instructional designers are capable to utilize existing instructional design models and theories to assist faculty and librarians adopt OER.

Summary

In this chapter, topics were researched which impacted a faculty member's ability to adopt OER. Faculty awareness and discovery of OER is improving; yet still has room for tremendous growth and efficiencies. Incentives for OER adoption are a broad range and not

available to everyone. Funding for OER initiatives remains weak and fragile, especially without permanent dedicated funding from government sources. Faculty who have adopted OER to replace a commercial textbook find the OER quality to be comparable or better than the replaced commercial textbook while overall faculty perception of OER quality considers commercial textbooks to be superior. Instructional designers can be a valuable asset to OER adoption by utilizing existing instructional design models to aid in the selection of OER materials and ensure their alignment in the course. The next section covers the methods and the theoretical framework in which this study will examine faculty perceptions of adopting OER.

Chapter Three: Methodology

This study examined the faculty perception of adopting open educational resources (OER) in Wyoming public higher education. Specifically, this study sought to address the factors which impact faculty decisions to adopt OER. Faculty were surveyed about their current level of OER adoption, their perceived barriers to OER adoption, and the perceived benefits to OER adoption. The following methodology assisted the researcher in the selection of a research design and context, solicitation of participants, data collection and analysis, and limitations.

Research Design

A research design demonstrates how researchers will conduct their study (Krathwohl & Smith, 2005). Krathwohl (1997) describes using a survey research design to gauge reactions from a representative sample size to generalize across a specific population. Krathwohl goes further in describing that a researcher is interested in the commonality of responses, variability of responses, and how responses vary within demographic variables. This study involved collecting responses from faculty across participating Wyoming institutions. Therefore, the researcher developed and deployed a survey and methodology to collect information about faculty's perceptions and attitudes toward OER adoption. The survey questions were quantitative with restricted item types such as multiple choice, ranking, and the Likert scale.

Context

The setting of this study was the Wyoming public higher education system, comprised of seven community colleges and one high-research, doctoral level university. Numerous studies have been conducted examining faculty use and perceptions of OER in a public higher education system or members of a geographic consortium. Cook and the Florida Distance Learning

Consortium (2010) lead a study to examine OER at all institutions in the State of Florida University System. Fischer et al. (2020) surveyed all the institutions in the Utah Academic Libraries Consortium regarding both faculty and student perceptions of OER. Lantrip and Ray (2020) surveyed faculty perceptions and adoption of OER at all Oregon Community Colleges. The Digital Higher Education Consortium of Texas surveyed all private and public institutions in the state of Texas (Jimes et al., 2021). The selection of the Wyoming public higher education system continued this practice and sought to fill a gap in literature regarding Wyoming statewide faculty perception of OER adoption.

Participants

Participants in this study were recruited from eight institutions that comprise Wyoming public higher education. Specifically, the target population included faculty who had an instructional assignment teaching a course in the Fall 2021 semester. Faculty offered valuable information regarding their selection of course materials and shed light on possible methods to help reduce the cost of these resources to students attending their respective institutions. No known report or data set exists for the Wyoming recruited participants; thus, this study was an opportunity to create baseline knowledge for this specific demographic and provide valuable information for public higher education in the state, in general. A review of U.S. Department of Education's Integrated Postsecondary Education Data System (IPEDS) at the National Center for Education Statistics (2022) for each public higher education institution in Wyoming yield the results listed in Table 4.

Table 4

IPEDS 2020-2021 Data on Instructional Faculty in Wyoming

Institution	Full Time Faculty	Part Time Faculty	Graduate Teaching Assistants
University of Wyoming	719	5	447
Casper College	128	187	0
Central Wyoming College	55	42	0
Eastern Wyoming College	36	61	0
Laramie County Community College	125	127	0
Northern Wyoming Community College	104	118	0
Northwest College	61	43	0
Western Wyoming Community College	75	234	0
Total	1,305	817	447

A total of 2,569 faculty members were employed in the entire system for the 2020-2021 academic year. The number of faculty categorized as full-time is 1,305 while 817 are categorized as part-time and 447 Graduate teaching assistants employed at one institution. All ranks such as instructor, lecturer, assistant professor, associate professor, and full professor were recruited. All tenure statuses were recruited (i.e., non-tenured, tenure-earning, and tenured faculty). Based off

the numbers varying of instructional faculty at each institution, the research concluded not to use sampling techniques.

Instrument

The survey instrument contained a combination of researcher developed questions derived from the literature on barriers and benefits to OER use and questions from existing instruments. Specifically, the research remixed demographic questions from the Open Education Group Faculty Survey by TJ Bliss, T. Jared Robinson, John Hilton, and David A Wiley and OER use and benefit/deterrent questions from Faculty Survey by Rajiv Jhangiani and Surita Jhangiani. Both surveys are available at <https://openedgroup.org/toolkit>. All existing instruments used have been released under a Creative Commons 4.0 attribution license which allowed for reuse and remixing without seeking prior permission. The resulting survey consisted of eighteen questions that were closed response (ordinal and formal). Qualtrics was used to collect participant responses and the final dataset was downloaded into SPSS for analyses. The first question asked faculty for their informed consent prior to continuing the survey and exited the survey for those faculty who chose not to participate.

Blair et al. (2014) suggests using an expert panel comprised of subject matter experts and survey method experts to review a survey to improve validity. The researcher recruited one national OER expert and one University of Wyoming OER expert to serve on a survey review panel. In addition, the researcher worked with two national experts in survey design and analysis. An Alpha Reliability Analysis, also known as Cronbach's Alpha, was conducted on Likert scale questions to understand their reliability. The textbook selection subscale consisted of 12 items ($\alpha = .73$), the ancillary resources subscale consisted of 5 items ($\alpha = .89$), the deterrents subscale

consisted of 13 items ($\alpha = .85$), and the benefits subscale consisted of 9 items ($\alpha = .79$). The overall scale consisted of 39 items ($\alpha = .87$) which indicates strong reliability.

A summary of question prompts for the instrument are listed below. See Appendix (D) for the entire instrument.

- Prior to your participation in this research, how aware are you of OER?
- Have you ever used OER in an academic course at your current institution?
- In how many academic courses have you used open educational resources (OER) at your current institution?
- How have you used open educational resources (OER) textbooks in your course(s)?
- Have you used any of the following open educational resources (OERs) in your courses before?
- Who has a role in selecting required course materials (including textbooks) for use in the courses you teach?
- When selecting a required course textbook, how important are each of the following factors to you?
- In general, how important are the following ancillary resources to your teaching?
- To what extent do you feel that the following are deterrents to the adoption of open educational resources (OER) in your courses?
- To what extent do you feel that the following are benefits for the adoption of open educational resources (OER) in your courses?

Data Collection

Research was conducted over the course of the 2021-2022 academic year. The researcher contacted eight chief academic officers requesting permission to participate in this study by distributing the survey to their faculty. Five institutions responded and directed the researcher to their respective institutional review boards (IRB) to obtain approval. Three institutions did not respond and two were excluded from the study. Study approval from the researcher's affiliated institution was provided by IRB. Upon each institution's IRB approval, the researcher requested faculty email addresses to recruit participants. Two institutions provided faculty email addresses and three institutions volunteered to send a recruitment message, the survey, and reminder messages on behalf of the researcher. At one institution, faculty email addresses were obtained from the Fall 2021 academic course schedule.

Faculty email addresses were entered in the Qualtrics survey platform in the form of a distribution list. The Qualtrics distribution method allows for customized invitations and reminder emails and easily tracking the progress of survey responses.

In addition to the survey link, participants received a solicitation message outlining the purpose of the research and details on their rights as a participant as outlined in the institutional IRB approval. Informed consent was received using the first question of the survey. For those faculty who chose not to participate, the survey immediately closed, and no response was recorded from the participant.

Data Analysis

After data collection, the survey response data was imported into IBM's Statistical Package for the Social Sciences (SPSS) software version 28 for analyses. Two hundred twenty-three responses (N= 223) were collected. No responses were excluded from analysis. Due to a

low number of responses from several institutions, a new variable was created which represented the participant's primary institution type. The coding scheme created two groups: two-year institutions and four-year institutions.

For measuring deterrents and benefits of OER adoption, the researcher employed the use of scaling. Scaling is a measurement technique for determining the magnitude of a latent variable (DeVellis, 1991). The 5-point Likert question response values ranged from Strongly Disagree to Strongly Agree. Each item was coded from 1 to 5 or low to high value, so the least perceived agreement was rated 1 (Strongly Disagree) and the highest perceived agreement was rated 5 (Strongly Agree).

A participant's scale score was created by the summation of their ranked responses to each item within *deterrents* and *benefits* questions. There were thirteen individual possible deterrent items. Therefore, the values for respondents' scores on that question ranged from a low of 13 (e.g., 13x1--if the participant selected 'Strongly Disagree' for each item, coded 1) to a high of 65 (e.g., 13x5--if the participant selected 'Strongly Agree' for each item, coded 5).

Similarly, there were nine individual possible benefit items. Therefore, the values for participant's scores on that question ranged from a low of 9 (e.g., 9x1--if the participant selected 'Strongly Disagree' for each item, coded 1.) to a high of 45 (e.g., 9x5--if the participant selected 'Strongly Agree' for each item, coded 5.)

Descriptive statistics were calculated for the survey questions. Merlter (2017) suggests using descriptive statistics to organize and summarize large amounts of data and to measure dispersion and relationships. Independent sample t-tests were performed using the deterrents and benefits scale score value as dependent variables and the collapsed institution level (2 yr or 4 yr),

awareness (not aware, aware) response, and OER use (yes or no, removing “I’m not sure” responses) as independent variables.

Limitations

Participants were recruited by an email message to their institutional email address. However, it is possible that based on the security settings that the recruitment email may be filtered as spam or junk mail by the institutional email system outside of the University of Wyoming. Faculty may not look in the spam or junk folder often or at all and so it is possible that some participation requests may have been missed. Also, faculty may easily overlook the recruitment message because of the sheer volume of email a faculty member receives daily.

Data collected in this voluntary study may not be representative of all institutions or academic departments in Wyoming public higher education. Due to the small number of faculty members at some institutions, an institution may not be represented at all. There may also be variability across different departments and colleges as to their adoption and/or philosophy with respect to OER use. Therefore, it may be difficult to draw academic department, demographic, and institutional generalizations beyond what is contained in this research

Summary

This chapter discussed the methodology for this research. A survey research design was selected as an effective method to collect data. Wyoming public higher education was established as the context based on other studies which survey faculty across a state-level organization. Every Wyoming public higher education institution was eligible to participate. The instrument was an adaptation of two different instruments and researcher developed questions. Data was collected over the 2021-2022 academic year. Data analysis was conducted using descriptive statistics and t tests in IBM’s SPSS software. The results of the study may be limited

due to email barriers in participant recruitment and results may not be generalizable across an institution. Chapter 4 discusses the results of data collection and analysis.

Chapter Four: Results

This chapter presents the results to answer three research question in this study of faculty OER adoption in Wyoming public higher education institutions.

The research questions are:

1. What is the current level of adoption?
2. What are the perceived barriers?
3. What are the perceived benefits?

Demographics

A total of 223 faculty in Wyoming public higher Education completed the survey. The majority of faculty were full-time (77%, n = 174), were tenured or on a tenure track (51% n=115), and employed at a four-year institution (59%, n = 134). A breakdown of academic position is available in Table 5, indicating that the highest number of faculty were Professors (20%) or Instructors (19%). Table 6 shows that the highest number of faculty responded that they had 20 or more years of experience (27%) with the next highest being 0-3 years of experience (20%), indicating a wide range of expertise.

Table 5

Faculty Academic Position (N = 209)

Academic Position	N	Total Percentage
Professor	43	20.6
Associate Professor	22	10.5
Assistant Professor	26	12.4
Lecturer	32	15.3

Instructor	40	19.1
Adjunct	23	11.0
GTA	14	6.7
Other	9	4.3

Table 6

Faculty Years in Higher Education (N = 185)

Academic Position	N	Total Percentage
0-3	36	19.5
4-7	31	16.8
8-10	20	10.8
11-14	24	13.0
15-19	24	13.0
20 or more	50	27.1

Research Question One

Research question one sought to determine the current level of OER adoption in Wyoming public higher education. To answer this question, participants were first asked to identify their awareness of OER using a scale ranging from not aware to aware and currently using OER. Participant responses indicated that 16% were not aware of OER (n = 36), 20% (n=44) had heard of OER but did not know much, 27% (n = 60) were aware but had not used OER for teaching, 15% (n=34) had previously used OER for teaching and 22% (n= 49) were aware and were currently using for teaching. Participants were then asked if they had used OER

in an academic course at their current institution with 35% (n = 79) responding *yes*, 46 % (n = 102) responding *no*, and 19% (n = 43) responding *I'm not sure*.

Crosstabulation was then used to compare participants OER *awareness* and *use* by several demographics thought to potentially impact these variables: institution type (2 yr/4 yr), academic position, and years of experience in higher education. These comparisons and discussions follow.

Table 7 shows that a high percentage of faculty were aware of OER at both 2-year and 4-year institutions. However, a larger percentage of faculty at 2-year institutions indicated that they were aware of OER (4 year=60%; 2 year = 76%) with more faculty at 4-year institutions indicating they were not aware of OER (4 year = 40%; 2 year = 24%). A chi-square test of independence was performed to examine the relationship between institution type and awareness. The relationship between these variables was significant, $\chi^2 (1, N = 208) = 4.91, p < .027$.

Table 7

Crosstabulation of Institution Type by Awareness (N = 208)

	Not Aware		Aware		Total	
	N	%	N	%	N	%
4 Year	53	39.6	81	60.4	134	100
2 Year	18	24.3	56	75.7	74	100

Table 8 illustrates participant's OER awareness by academic position. The highest percentage of those who were aware of OER were Instructors (83%). The GTA/TA academic position was the only academic position with a majority who were not aware of OER (57%). Overall, awareness of OER was high among every other faculty position.

Table 8

Crosstabulation of Academic Position by Awareness (N = 209)

	Not Aware		Aware		Total	
	N	%	N	%	N	%
Professor	20	46.5	23	53.7	43	100
Associate Professor	8	36.4	14	63.6	22	100
Assistant Professor	6	23.1	20	76.9	26	100
Lecturer	11	34.4	21	65.6	32	100
Instructor	7	17.5	33	82.5	40	100
Adjunct	9	39.1	14	60.9	23	100
GTA/TA	8	57.1	6	42.9	14	100
Other	2	22.2	7	77.8	9	100

Participants' experience in higher education and awareness is illustrated in Table 9. Faculty with 8-10 years of experience had the highest awareness of OER (85%) with the lowest reported awareness of OER being those with 0-3 years of experience (53%). However, all experience levels had the majority of faculty report they were aware of OER.

Table 9

Crosstabulation of Faculty Experience by Awareness

	Not Aware		Aware		Total	
	N	%	N	%	n	%

0-3	17	47.2	19	52.8	36	100
4-7	8	25.8	23	74.2	31	100
8-10	3	15.0	17	85.0	20	100
11-14	7	29.2	17	70.8	24	100
15-19	7	29.2	17	70.8	24	100
20 or more	18	36.0	32	64.0	50	100

Table 10 shows that nearly half of faculty had used OER at the 2-year schools (49%), while only 28% of the 4-year faculty indicated that they had used OER. A chi-square test of independence indicated that the relation between institution type and use was significant, $\chi^2 (2, N = 208) = 8.603, p < .014$.

Table 10

Crosstabulation of Institution Type by Use (N = 208)

	Yes		No		Not sure		Total	
	N	%	N	%	N	%	N	%
4 Year	38	28.4	69	51.5	27	20.1	134	100
2 Year	36	48.6	28	37.8	10	13.5	74	100

Table 11 depicts the breakdown of faculty position by use. Instructors were the only position in which the majority had used OER (58%). The majority of those indicating they were Professors (61%), Associate Professors (59%), Assistant Professors (54%), or Other (67%) had not used OER. GTA/TA were the only position in which the majority were not sure if they had used OER before (50%).

Table 11

Crosstabulation of Academic Position by Use (N=209)

	Yes		No		Not Sure		Total	
	N	%	N	%	N	%	N	%
Professor	10	23.3	26	60.5	7	16.3	43	100
Associate Professor	7	31.8	13	59.1	2	9.1	22	100
Assistant Professor	9	34.6	14	53.8	6	11.5	26	100
Lecturer	12	37.5	14	43.8	6	18.8	32	100
Instructor	23	57.5	13	32.5	4	10.0	40	100
Adjunct	7	30.4	9	39.1	7	30.4	23	100
GTA/TA	4	28.6	3	21.4	7	50.0	14	100
Other	2	22.2	6	66.7	1	11.1	9	100

Research Question Two

Research question two sought to identify deterrents to OER adoption at participating Wyoming public higher education institutions. To answer this question, participants were asked to identify who has a role in the selection of the course required materials, for the courses that they teach. Participants had the ability to check all that apply for this question to allow for the complexity of text selection across various departments and institutions. Results (Table 12) indicated that the overwhelming majority (75%) of faculty have sole determination in selecting their course materials (n = 163).

Table 12

Who has a role in selecting required course materials (including textbooks) for use in the courses you teach? (N = 215, multiple responses possible)

	N	Percent of Cases
I am solely response for the selection	163	75.8
I am a member of a committee/group that makes the selection	21	9.8
Another faculty member makes the selection	20	9.3
Course developer	16	7.4
Entire department	15	7.0
A faculty committee of which I am not a member	7	3.3
I lead a committee/group that makes the selection	5	2.3
Administration	4	1.9
Instructional design group	2	.9
Total	253	117.7

To identify issues that might prevent or discourage faculty from using OER in their courses, thirteen individual perceived deterrents to OER questions were presented in a Likert scale question. The question response choices ranged from *Strongly Disagree* (coded as 1) to *Strongly Agree* (coded as 5). Table 13 provides the means and the standard deviations of the responses to this question, listed from highest rated to lowest rated. Those with the highest mean depict the strongest perceived deterrents while lower means indicate issues that perceived as less of a concern or deterrent.

Table 13

To what extent do you feel that the following are deterrents for the adoption of open educational resources (N = 208)

	<i>M</i>	<i>SD</i>
Too difficult to find what I need	3.58	1.013
No comprehends catalog of resources	3.58	.994
Not enough OER in my subject area	3.52	1.074
Not high quality	3.10	1.148
No available ancillary resources	2.98	1.169
Not current, up to date	2.97	1.165
Not knowing if I have permission to use or change	2.86	1.262

Unprofessional appearance	2.79	1.155
Too difficult to integrate into technology I use	2.51	1.088
Lack of support from institution	2.42	1.129
Lack of support from department	2.32	1.165

Cronbach's alpha (α) indicated a high level of reliability ($\alpha = .85$) for the deterrents scale created by the summation of each coded value (1=Strongly Disagree to 5=Strongly Agree) for the thirteen questions. Summary statistics for the overall scale are presented in Table 14, including sample size, mean, standard deviation, range of scores, skewness and kurtosis.

Table 14

Summary Statistics for the OER Deterrents Scales

	N	Range	Mean	Std Dev	Skewness	Kurtosis
Deterrents	204	16-65	37.89	8.82	-0.13	0.150

Examining by institution type (Table 15) found no significant difference between perceived OER adoption deterrents for those in 2-year (M=37.06, SD=9.36) versus 4-year (M=38.24, SD=8.45) respondents, $t(201) = .92$, $p=.36$.

Table 15

Results of t-tests for OER Adoption Deterrents by Institution Type

	N	Mean	Std Dev	t	p
Deterrents 2-year	72	37.06	9.36	-.92	.36

4-year	131	38.24	8.45	
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Perceived deterrents were also not significantly different between tenured/tenure track participants (M=37.61, SD=8.86) and those non-tenured (M=37.50, SD=8.81) participants, $t(177) = 0.08, p=.94$. Table 16 shows the breakdown of this analysis.

Table 16

Results of t-tests for OER Adoption Deterrents by Tenure Status

	N	Mean	Std Dev	t	p
Deterrents Tenured/ Tenure Track	113	37.61	8.85	0.08	.94
Non-Tenure	66	37.50	8.81		

Examining perceived OER adoption deterrents by participants awareness found a significantly higher perception of deterrents among those who said they were not aware of OER (M=40.70, SD=6.91) than those who said they were aware of OER (M=36.46, SD=9.35), $t(202) = 3.326, p=.00$.

Table 17

Results of t-tests for OER Adoption Deterrents by Awareness of OER

	N	Mean	Std Dev	t	p
Deterrents Not aware	69	40.70	6.91	3.33	.00
Aware	135	36.46	9.35		

Examining perceived OER adoption deterrents for only those who had said definitively that they had used OER or not (answered yes or no) and excluding those who said “I’m not sure” (Table 17) found a significantly higher perception of deterrents among those who had never used OER (M=39.27, SD=7.62) than those who said they had used OER (M=34.68, SD=10.24), $t(166) = 3.33, p=.00$ (see Table 18).

Table 18

Results of t-tests for OER Adoption Deterrents by OER use (yes/no)

	N	Mean	Std Dev	t	p
Deterrents Used OER	71	34.68	10.24	3.33	.00
Not used OER	97	39.27	7.62		

Research Question Three

Research question three sought to determine the perceived benefits to OER adoption for the Wyoming public higher education participants. To answer this question, participants were asked about the importance of various attributes which a faculty member might consider important when selecting course materials. There were ten individual questions presented in a Likert Scale question response. The question response choices ranged from *Not Important* (Coded 1) to *Extremely Important* (Coded 5). Table 19 provides the means and the standard deviations for each item listed from highest to lowest, with those that faculty perceived as the highest benefit having the highest mean value and those with the lowest mean indicating items less of a perceived benefit.

Table 19

When selecting a course textbook, how important are each of the following (N = 208)

	<i>M</i>	<i>SD</i>
Clear and accessible writing	4.23	.764
Comprehensiveness of coverage	4.02	.794
Cost to the student	3.96	.909
Reputation of authors	3.55	1.109

Recently updated edition	3.39	1.067
Ease of fit with current teaching materials	3.17	1.136
Use/recommended by other faculty members	2.82	1.055
Quality of ancillary resources	2.79	1.396
Integrates with my learning management system (LMS)	2.57	1.344
Relationship with publisher representation	1.63	.952

Next, faculty were asked their perceptions on items viewed as possible benefits to OER adoption. There were nine individual perceived benefits to OER adoption questions presented in a Likert Scale format. The question response choices ranged from *Strongly Disagree* (coded as 1) to *Strongly Agree* (coded as 5). Table 20 provides the means and the standard deviations listed from highest to lowest with those items having the highest means indicating faculty perceived benefit of OER adoption and those with the lowest mean indicating items perceived as less of a benefit.

Table 20

To what extent do you feel that the following are benefits for the adoption of open educational resources?

	<i>M</i>	<i>SD</i>
Save students signification money on course material	4.49	.798

Access on the first day of the course	4.23	.958
Not required to use a new edition of a commercial materials	3.87	.923
Leads to same or better student success	3.71	1.019
Ability to modify	3.64	.973
Up to date materials	3.61	.952
Ability to print	3.53	1.009
Quality is same or better than commercial materials	3.38	.985
Others using same materials in my department	2.71	1.183

Cronbach’s alpha (α) indicated a high level of reliability ($\alpha = .79$) for the benefits scale, created by the summation of each coded value (1=Strongly Disagree to 5=Strongly Agree) for the 9 questions. Summary statistics for the benefits scales is presented in Table 21, including sample size, mean, standard deviation, range of scores, skewness and kurtosis.

Table 21

	N	Range	Mean	Std Dev	Skewness	Kurtosis
Benefits	205	19-45	33.18	5.42	-0.01	-0.344

Examining perceived OER adoption benefits by institution type found those respondents at 2-year institutions reported higher perceived significantly higher benefits to OER (M=34.55, SD=5.80) than those at 4-year institutions (M=32.42, SD=5.09), $t(202) = 2.72, p=.01$

Table 22

Results of t-tests for OER Adoption Benefits by Institution Type

		N	Mean	Std Dev	t	p
Benefits	2-year	73	34.55	5.80	2.7	.01
	4-year	131	32.42	5.89		

Examining perceived OER adoption benefits by tenure status found slightly higher perceived but not significant benefits to OER among tenured/tenure track respondents (M=33.78, SD=5.43) than those non-tenured (M=32.43, SD=5.42), $t(179) = 1.59, p=.12$.

Table 23

Results of t-tests for OER Adoption Benefits by Tenure Status

		N	Mean	Std Dev	t	p
Benefits	Tenured/ Tenure Track	113	32.46	5.42	1.59	.12
	Non- Tenure	68	33.78	5.43		

Examining perceived OER adoption benefits by respondents' awareness found a significantly higher perception of deterrents among those who said they were not aware of OER (M=40.70, SD=6.91) than those who said they were aware of OER (M=36.46, SD=9.35), $t(202) = 3.326, p=.00$.

Table 24

Results of t-tests for OER Adoption Benefits by Awareness of OER

		N	Mean	Std Dev	t	p
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Benefits	Not aware	69	33.22	5.11	.07	.95
	Track					
	Aware	136	33.16	5.59		

Examining perceived OER adoption deterrents and benefits for only those who had said definitively that they had used OER or not (answered yes or no) found a significantly higher perception of deterrents among those who had never used it (M=39.27, SD=7.62) than those who said they had used OER (M=34.68, SD=10.24), $t(166) = 3.33, p=.00$.

Table 25

Results of t-tests for OER Adoption Benefits by OER use (yes/no)

		N	Mean	Std Dev	t	p
Benefits	Used OER	72	34.15	5.38	2.65	.01
	Not used OER	96	31.95	5.32		

Summary

This chapter discussed the results of data collection and analysis. The results for research question one found faculty were significantly aware of OER; however, the majority of faculty have not used OER. Results for research question two identified discoverability has a major perceived deterrent. Finally, results for research question three discovered the top perceived benefits were student facing, including saving money, first day access, and improved student success.

Chapter 5: Discussion

This study was conducted to understand faculty perception of adopting OER in Wyoming Public Higher Education. The adoption of OER by Wyoming Public Higher Education faculty is one method to reduce the overwhelming student cost of higher education while ensuring permanent access to vital course materials. The research questions for this study were:

1. What is the current adoption level of OER?
2. What are perceived barriers to OER adoption?
3. What are the perceived benefits to OER adoption?

A survey research design was employed to collect data from each Wyoming public higher education institution. The survey instrument contained a combination of existing survey instruments and researcher developed questions derived from the literature. Participants (n = 223) from six Wyoming public higher education institutions completed the survey. A discussion of the results for each research question is below.

Research Question One: What is the current adoption level of OER

The first research question focused on determining the current level of OER use in the participating Wyoming public higher education institutions. To address this, participants were asked their awareness and use of OER.. It was expected that some faculty might have heard of OER but did not use it in their courses, but awareness was much higher than use. Most responding faculty were full time, tenured, and employed at a 4-year institution. Experience was well dispersed, with faculty ranging from few to many years.

Participants overall awareness was higher than anticipated and above what is reported in recent reports (Allen & Seaman, 2016; Spilovoy et al., 2020). The focus of the overall cost of higher education could be a contributing factor to increased OER awareness. Recently, there

has been much public attention drawn to student debt and economic disparity and its impact on students, particularly students who are underserved (Friedman & Laurison, 2019; Hess, 2020; Mitchell, 2020; Pell Institute, 2021). This has been exacerbated by the 2020 COVID-19 pandemic and has sparked conversations about the high cost of public education and an examination of ways to decrease those costs. In addition, the swift move to emergency remote instruction starting in the Spring 2020 semester greatly increased the need for course materials to be digital instead of print based for remote access. The lingering effects of the 2020 COVID-19 pandemic can have lasting repercussions on the future availability and formats of course materials. Faculty demonstrating OER awareness create opportunities for OER use which in turn lower student cost, provide first day access, and lead to similar or better student success.

Absent specific institutional and statewide initiatives, participants would also be exposed to OER mentions through their professional associations and mentions in their higher education news sources, thus being “aware” of OER. But many may not engage in its use without incentives or direct initiatives. Awareness alone does not guarantee an ability to competently incorporate OER in an academic course.

The number of participants (n = 43) who were not sure if they had previously used OER was a surprise to the researcher because it is misaligned with the literature. One possibility for this response is that faculty associated no cost digital materials such as YouTube videos or Websites (i.e., free) to being OER. The distinguishing difference between free vs OER is the intellectual property license attached to the material. OER should be clearly identified with an open license such as Creative Commons which clearly outlines the possibilities of use. The major benefit of OER is the blanket permission to store and edit content at the faculty’s

discretion. Free materials automatically receive United States copyright protection unless another type of intellectual property license is applied. Copyrighted materials cannot be altered or stored without the express permission of the copyright holder. Violating an intellectual property license can have negative repercussions to faculty and the institution ranging from a cease-and-desist notice to legal action for copyright infringement. One method to understand if materials are OER is to apply Wiley's (2014) 5Rs framework. Wiley lists five criteria to determine if an item is an OER: retain, reuse, revise, remix, and retain.

- **Retain:** the right to make, own, and control copies of the content
- **Reuse:** the right to use the content in a wide range of ways (e.g., in a class, in a study group, on a website, in a video)
- **Revise:** the right to adapt, adjust, modify, or alter the content itself (e.g., translate the content into another language)
- **Remix:** the right to combine the original or revised content with other open content to create something new (e.g., incorporate the content into a mashup)
- **Redistribute:** the right to share copies of the original content, your revisions, or your remixes with others (e.g., give a copy of the content to a friend)

If faculty can answer yes to all five criteria, the material is OER. Faculty who are unsure about one or more criteria should seek additional support from librarians, instructional designers, or other personnel knowledgeable in OER licensing. Moving from general awareness to faculty identification and interaction with OER can increase use.

Research Question Two: What are the perceived barriers to OER adoption?

A significant challenge to increased use of OER is removing perceived barriers. The second research question aimed to identify what barriers were most commonly perceived by

faculty in Wyoming public higher education. The survey question focused on barriers commonly mentioned in the literature (see Appendix D for survey instrument) and responses were examined for overall trends as well as differences among the demographics. Based on the experience of the researcher, it is more difficult to adopt OER when multiple people are involved in the course material selection process compared to dealing solely with the faculty assigned to a course. Understanding who determines the choice for course textbook and instructional materials is one component of the complex OER adoption process.

Participants overwhelmingly responded (n = 163) that the faculty member has sole authority for the selection of course materials. This is a significant finding that identifies the key stakeholder who has the ultimate decision about adopting OER for a course. Understanding who this person is and the context in which they develop and deliver their course is imperative to understanding their course material selection behavior and potential for using OER. Initiatives and resources can be strategically targeted to the decision makers to help increase OER use.

Participants reported barriers related to discoverability as the top three perceived deterrents for OER adoption. This finding aligns with the literature available (Allen & Seaman, 2016, 2017; Anderson & Leachman, 2019; Seaman & Seaman, 2017), which summates that faculty cannot find OER for specific courses or are unaware of repositories containing searchable OER content. To overcome challenges related to discoverability of OER, faculty can partner with specific personnel such as librarians and instructional designers to discuss course content needs and attempt to locate existing resources that will fit their instructional needs while lowering student costs. Faculty recognize cost savings; however, the difficulty of finding existing OER materials is overwhelming barrier for many. There may not be adequate OER materials available which may pivot faculty to OER creation. Developing a customized course material

plan as a faculty member independently or in partnership with a materials expert, can assist with determining the best methods for lowering textbook costs which may or may not include OER.

Perception of inferior OER quality was highly rated as a barrier by participants after discoverability. The literature contradicts this negative quality perception of OER. Often, OER quality is considered by faculty to be the same or better as commercial textbooks (Allen and Seamans, 2014, 2016, 2017;) Jhangiani et al., 2016; Jung et al, 2017). Combating this perception will necessitate faculty engaging with OER to overcome quality concerns. Engage faculty in peer review of existing resources with an existing OER rubric from such organizations as Open SUNY or Affordable Learning Georgia will help familiarize faculty with OER and allow them to evaluate the quality of the resources. This may in return change the perception that OER is inferior to commercially published books and materials. This can be accomplished through an existing or new professional development program that offers continuing education credit or a monetary stipend. Providing incentive to faculty increases OER adoption. Types of incentives may include direct compensation, a course release, recognition through institutional awards or promotion and recognition as an expert in one's field. One requirement of receiving an incentive is to make reviews publicly available to educate other faculty about the quality of OER material. This type of review already occurs in other course material resources such as books and journal articles.

Participants who were not aware or had not used OER perceived higher deterrents than participants who were aware or had used OER. The perceived effort to adopt OER is higher if faculty are not aware of or do not use it. This is a finding that needs to be explored in more detail for future study. Creating ways to overcome the perceived deterrence will be critical to increase OER use. Finding targeted opportunities to engage with OER such as reviews or as supplemental

content instead of replacing an entire commercial textbook may increase use. Working with a librarian or instructional designer to create a customized OER use plan for your course may reduce deterrents to a point where faculty will consider using OER.

Research Question Three: What are the perceived benefits of OER adoption?

The third research question sought to understand perceived benefits for OER use among faculty in Wyoming public higher education. The survey question focused on benefits commonly mentioned in the literature and responses were examined for overall trends as well as compared among the demographics. Also important was measuring the various attributes which a faculty member might consider important when selecting course materials.

A significant finding is three of the top four rated benefits for adoption are student facing. Cost, first day access, and the same or better student performance are highly rated benefits for OER use. Because responses were dominantly student facing indicates a focus on student needs by the faculty thus use would promote student benefits such as lower course materials costs, reduce overall student debt, and be provided with immediate and in perpetuity access to course materials while continuing or improving academic success. The fourth and highest rated faculty facing benefit was not having to switch editions on a commercial publisher schedule. Instead, faculty decide when or if to adopt a new version of an OER. This has a tremendous implication for faculty workload as faculty would no longer be bound to external pressures such as publisher representations or bookstore managers to change editions during the summer or early fall when they may or may not be on contract or have the time to update course instruction to accommodate the new edition. In addition, faculty also get to choose which changes they want to adopt versus a commercial textbook that cannot be altered without creating a costly, cumbersome custom edition that eliminates most cost-reducing options for students, such as renting a

textbook. Perhaps an unintended positive consequence of OER adoption is the ability for faculty to contribute updates back to the original authors or share their own custom edition. Course content should not be static. OER promotes a dynamic, personalized, iterative quality improvement process versus waiting for another edition of a commercial textbook released on an academic year sales cycle. For example, Openstax maintains an errata list where individuals can suggest corrections to mistakes made by the authors or suggest improvements. OER materials without this type of update/correction mechanisms can be shared through global repositories like OER Commons or MERLOT, institutional repositories, or restricted to the learning management system.

Overall, responses to these research questions are a valuable study of OER in Wyoming public higher education. The findings, while significant, represent a baseline understanding of the current use, and perceptions about barriers and benefits. The following sections detail possible next steps for Wyoming public higher education and a future research agenda.

Implications

The results of this study demonstrated significant OER awareness among Wyoming public higher education faculty while indicating that OER usage is underutilized. Faculty have difficulty finding quality materials for their subject matter, hampering their OER adoption efforts. Faculty see cost savings, first day access to course materials, not being required to update editions, and potential for learning gains as strong benefits of OER adoption.

OER use by faculty has considerable implications for their courses. The textbook is a fundamental component of an academic course and to change from a commercial textbook to using OER can be a major undertaking. One method to assist faculty is to slowly adopt OER resources to help familiarize them with its use. Start with replacing one chapter or course subject at a time.

Identify gaps in existing materials that could be filled by faculty or student created course materials. Faculty may feel overwhelmed because they truly have full control over their course content versus the rigidity of commercial textbooks where they might require students to purchase a book but use only a fraction of the content for a specific course.

OER use by faculty has institutional implications. There is the need for institutional investment to increase OER adoption through providing specific personnel that can provide significant support such as librarians and/or instructional designers. These dedicated resources can be used in a programmatic fashion to help a specific degree program transition to using OER. Degree programs should be selected based on the strategic needs of the institution such as serving at-risk student populations or student recruitment. In addition to personnel, faculty need time and additional compensation to transition their courses to use OER. Reallocating institutional funds or seeking public/private grant opportunities are opportunities to acquire funding for incentives and additional personnel to facilitate OER implementation.

OER use by faculty has implications for Wyoming public higher education. Wyoming is in a unique position as there are eight public higher education institutions in the state. Expanding the existing statewide efforts such as the Open Range program to emphasize OER adoption in higher education can lead to significant gains. The OER infrastructure is in place and is currently being utilized by Wyoming public K-12 education including a dedicated repository in OER commons and an OER champions website. The intentional shift to focus on higher education will lower student textbook costs and increase access to quality OER materials. In addition, Wyoming does not have to create a state-wide strategy from scratch. Joining an organization like the Open Education Network can provide much needed resources and expertise from throughout the United States on how to create and manage a state-wide OER strategy.

Future Research

This study questioned OER adoption in Wyoming public higher education. It sought to examine faculty perceptions about OER. While OER awareness was significant, the minority of faculty used OER. It is recommended that future research examine courses at each institution that used OER for faculty and student perceptions along with measuring student success and satisfaction. A document analysis could be conducted on the required course materials list looking OER adoption patterns including course level and academic discipline or identify high-cost materials that may have existing OER ready for adoption. Generating localized research may increase faculty interest in adopting OER, and it can build understanding about what is required to successfully expand the use of OER in particular contexts and curricula. Additionally, asking faculty the cost of their current required course materials may cause them to seek lower cost alternatives which may include OER.

This study has examined the perceived barriers to OER adoption and found that discoverability is a major barrier. OER is not currently available for every subject area taught in Wyoming public higher education. It is recommended that future projects be conducted to create OER that would allow for OER resources in a specific area to grow and thus establish broader OER use and allow faculty to contribute scholarship to their academic discipline. Important topics include intellectual property ownership, resources required to create (i.e., time, money, additional staff), and perceived benefits to faculty's career.

Conclusion

This study demonstrated the current use, perceived barriers, and perceived benefits of OER in Wyoming public higher education. Faculty are generally aware of OER; however, most have not used it. The perception is OER is difficult to find or simply does not exist for specific

courses. Faculty believe OER can reduce student costs, provide immediate access to course materials, and provide similar or better student performance. This study has created new knowledge about OER use in Wyoming. Faculty, institutions, and the Wyoming government can utilize this information to develop a state-wide OER adoption workflow provide to lower student costs while maintaining academic quality.

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Appendix A: Informed Consent

Description of Study

You have been identified as a faculty member at your institution. You are in a unique position to share your perceptions about adopting open educational resources by completing this survey. Results from this survey will assist efforts to make textbooks and other course materials more affordable to students. This is your chance to make a difference.

This survey should take 10-15 minutes to complete in one sitting. You may not stop and restart.

Risks

There are minimal risks associated with this study. The possibility of frustration may occur if you recognize a desire to use OER but are prevented by institutional personnel or OER is not available for their academic subject. There is also a risk that you feel dissatisfied about spending time taking the survey with no direct benefit of your participation.

Benefits

There is no direct benefit for participation.

Cost and Incentives

There is no cost to participate.

Confidentiality

No personal identification will be collected during this study. Information obtained in this study is strictly confidential unless disclosure is required by federal or state law. Data will be combined with other respondents' data and analyzed only as a group. The aggregated results of the study may be used in reports, publications, and faculty professional development.

Withdrawal Privilege

You may decline participation without penalty. If you begin the survey and change your mind about participating, you may exit the survey at any point. No questions will be required.

Incomplete survey results may be excluded from final reporting.

Researchers

If you have any questions or concerns with this study, please contact the researchers:

Primary Researcher:

- John Raible, Doctoral Candidate, University of Wyoming
- Email: jraible@uwyo.edu
- Phone: 386-748-1677

Faculty Supervisor:

- Mia Williams, Assistant Professor, University of Wyoming
- Email: mwill114@uwyo.edu
- Phone: 307-766-2004

Contact Information

If at any time you have any questions about your rights as a participant, you should contact the University of Wyoming Human Subjects Review Committee.

Institutional Review Board

Phone: 307-766-5322

Room 308, Old Main

Fax: 307-766-2608

1000 East University Avenue, Department 3355

email: IRB@uwyo.edu

Laramie, WY 82071

Appendix B: Attribution

Dick, Carey, and Carey Instructional Design Model by Tonia Dousay, Robert Brach, and AECT is used under a Creative Commons Attribution 4.0 license.

[Open Education Group Faculty Survey](#) by TJ Bliss, T. Jared Robinson, John Hilton, and David A Wiley is used under a Creative Commons Attribution 4.0 license.

[Faculty Survey](#) by Rajiv Jhangiani and Surita Jhangiani is used under a Creative Commons Attribution 4.0 license.

Appendix C: University of Wyoming IRB Approval

UNIVERSITY
OF WYOMING

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October 28, 2021

John Raible Graduate Assistant
Counseling, Leadership, Advocacy, and Design University of Wyoming

Mia Williams Assistant Professor
Counseling, Leadership, Advocacy, and Design University of Wyoming

Protocol #20211028JR03156

Re: IRB Proposal *“Faculty Perception of Adopting Open Educational Resources in Wyoming Public Higher”*

Dear John and Mia:

The proposal referenced above qualifies for exempt review and is approved as one that would not involve more than minimal risk to participants. Our exempt review and approval will be reported to the IRB at their next convened meeting on November 18, 2021.

Any significant change(s) in the research/project protocol(s) from what was approved should be submitted to the IRB (Protocol Update Form) for review and approval prior to initiating any change. Further information and the forms referenced above may be accessed at the “Human Subjects” link on the Office of Research and Economic Development website: <http://www.uwyo.edu/research/human-subjects/index.html>. Please note that exempt protocols are approved for a maximum of three years. If your study extends beyond three years, or beyond the duration that is approved in your protocol form, please be sure to submit an update before expiration to extend the duration. If you are not able to submit the update in time, you will need to submit a new exemption request for the project.

You may proceed with the project/research and we wish you luck in the endeavor. Please feel free to call me if you have any questions.

Sincerely,
Nichole Person

Appendix D: Survey Instrument

Question 1: Informed Consent. Please see Appendix A.

Question 2: How aware are you of open educational resources (OER)? OER is defined as "teaching, learning, and research resources that reside in the public domain or have been released under an intellectual property license that permits their free use and re-purposing by others." Unlike traditionally copyrighted material, these resources are available for "open" use, which means users can edit, modify, customize, and share them.

- I am not aware of OER
- I have heard of OER, but don't know much about them (2)
- I am aware of OER and but have not previously used them for teaching (3)
- I am aware of OER and have previously used them for teaching (4)
- I am aware of OER and currently use them for teaching (5)

Question 3: Have you ever used OER in an academic course at your current institution?

- Yes
- No
- I'm not sure

Question 4: How many unique academic courses have you used OER at your current institution

- 1
- 2
- 3
- 4
- 5
- More than 5

Question 5: How have you used OER Textbooks in your course(s) Select all that apply

- Used as primary textbook; replacing a commercial textbook
- Used as supplemental textbook or materials while still requiring a commercial textbook
- I have not used an OER textbook

Question 6: Have you used any of the following OERs in your courses before? Select all that apply

- Videos
- Audio

- Images
- Infographics
- Games or simulations
- Tutorials
- Tests and quizzes
- Open textbooks, chapters from textbooks
- Homework exercises
- Slides and class presentations
- Whole course
- Elements of an existing course e.g. a module/unit

Question 7: Who has influence in selecting required course materials (including textbooks) for use in the courses you teach? Select all that apply.

- I am solely responsible for the selection
- Another faculty member makes the selection
- I lead a committee/group that makes the selection
- I am a member of a committee/group that makes the selection
- A faculty committee of which I am not a member
- Entire department
- Course developer
- Instructional design group
- Administration

Question 8: When selecting a required course textbook, how important are each of the following to you

	Not at all important	Slightly important	Moderately important	Very important	Extremely important
Cost to the student	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Reputation of author(s)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Quality of ancillary resources (e.g., question bank, Powerpoint slides, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Comprehensiveness of coverage	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Recently updated edition	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Used/recommended by other faculty members	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Clear & accessible writing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Theoretical orientation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ease of fit with current teaching materials	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Works with my institutions' Learning Management System (LMS)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Relationship with publisher's representative	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sponsorships or other financial incentives offered by the publisher	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Question 9: In general, how important are the following ancillary resources to you?

	Not important	Slightly important	Moderately important	Very important	Extremely important
Test/Question bank	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
PowerPoint slides	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Instructor activity manual	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Adaptive quizzing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Online student resources (e.g. flashcards, tutorials, demos, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Question 10: To what extent do you feel that the following are **deterrents** to the adoption of open educational resources in your courses?

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
Too difficult to find what I need	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
No comprehensive catalog of resources	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Not enough OER resources for my subject area	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
No available ancillary resources	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Unprofessional appearance	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Not current, up-to-date	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Not knowing if I have permission to change	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lack of support from my institution	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lack of support from the department	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Too difficult to change or edit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Too difficult to integrate into technology I use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Not used by
other faculty I
know

Not high-
quality

Question 11: To what extent do you feel that the following are **benefits** for the adoption of open educational resources in your courses?

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
Save students significant money on course materials	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Access on the first day of class	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Leads to same or better student success	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ability to modify	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ability to print	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Not required to use a new edition of commercial materials	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Quality is same or better than commercial materials	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Up-to-date materials	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Others using same materials in my department	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Question 12: What is your employment status?

- Full-Time
- Part-Time

Question 13: Are you teaching at least one academic course in the Fall 2021 semester?

- Yes
- No

Question 14: What is your academic position?

- Professor
- Associate Professor
- Assistant Professor
- Lecturer
- Instructor
- Adjunct
- GTA/TA
- Other

Question 15: What is your tenure status?

- Tenured or Tenure Track
- Non-Tenure

Question 16: What primary institution are you employed by?

- Casper College
- Central Wyoming College
- Eastern Wyoming College
- Laramie County Community College
- Northern Wyoming Community College District
- Northwest College
- University of Wyoming
- Western Wyoming Community College

Question 17: How many years have you been a faculty member in higher education?

- 0-3
- 4-7
- 8-10
- 11-14
- 15-19
- 20 or more

Question 18: What is your academic field?

- Arts
- Education
- Engineering
- Health
- Humanities
- Law
- Sciences
- Natural Resources
- Other

This survey is remixed from [Open Education Group Faculty Survey](#) by TJ Bliss, T. Jared Robinson, John Hilton, and David A Wiley and from [Faculty Survey](#) by Rajiv Jhangiani and Surita Jhangiani. Both surveys are used under a Creative Commons Attribution 4.0 license.