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(cont'd.)

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Mission Statement

The aim of *IJOER* is to provide a venue for the publication of quality academic research with an emphasis on representing Open Educational Resources in teaching, learning, scholarship and policy.

The International Journal of Open Educational Resources (IJOER) is a bi-annual, open access, double-blind peer-reviewed academic publication sponsored by the American Public University System (APUS) and the Policy Studies Organization. ***IJOER* is the first academic journal to focus solely on open educational resources.**

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IJOER welcomes a multidisciplinary approach on all aspects of OERs and the challenges and opportunities they present. Given the diversity of research and researchers across the globe, articles reflecting scientific, artistic, critical, and conceptual works are all fitting contributions to *IJOER*. Methods used in articles may be quantitative, quantitative, comparative, mixed, collaborative, action-oriented, appreciative, ethnographic, and/or critical in substance. For more information, you may refer to the ***IJOER* Author Guidelines** (https://www.ijoer.org/guidelines/)

You may also send your manuscript directly to Editor in Chief, **Dr. Melissa Layne,** mlayne@apus.edu

Publication Schedule

Spring/Summer (April)

Proposals due: February 1

Peer reviews: February 2 – 28

Author edits: March 1 – 30

Publication: May15

Fall/Winter (October)

Proposals due: August 1

Peer reviews: August 2 – 30

Author edits: September 1 – 30

Publication: October 15

Call for Papers (ongoing)

Letter from the Editor

Melissa Layne
American Public University System, USA

Dear Readers of *IJOER*,

Spring has arrived in many US states as well as in other countries, and what a perfect time to release the *IJOER* Spring/Summer 2021 issue! This issue includes some impressive studies that will add to and advance the literature on Open Educational Resources (OER) in new and exciting directions. Professor Mpine Makoe of Unisa is featured in our special section, 3 Questions for an OER Leader. Mpine graciously agreed to an interview and shared her most recent open education contributions and initiatives and are centered on social justice, equity, inclusion, accessibility, and participation in order to resolve the injustices that have prevented many people from accessing higher education, especially in South Africa.

Some of the articles in this issue address the ongoing challenges of OER adoption and implementation experienced by universities, faculty, and students and provide innovative approaches to these barriers. Student and faculty perceptions and student achievement also continue to stand at the fore of OER topics. More and more, we are seeing more essential discussions around an understanding that OER and OEP are not mutually-exclusive. A couple of our articles highlight OER course and curricular design. Below, you will find brief descriptions of each article as it is situated under these overarching, key areas in OER.

OER and Student Achievement. Lane Fischer, Yao Xiong, Virginia Clinton-Lisell, John Hilton III, David Wiley and Linda Williams authors of *The Interaction of Open Educational Resources (OER) Use and Course Difficulty on Student Course Grades in a Community College,* point us in a novel research direction by examining the impact of OER on student achievement as a function of course difficulty. Controlling for student gender, previous grade point average, and Pell grant eligibility status, the significant results of this study shed some new light on understanding the effects OER and non-OER use as a function of course difficulty.

Megan Dempsey's article, *The Impact of Free and Open Educational Resource Adoption on Community College Student Achievement* also reports a significant impact of OER and non-OER use on student performance and persistence by exploring student outcomes for all students in her study, in addition to Pell grant recipients, part-time, first-time and non-white students. Exploring variables linked

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to students' grade achievement not only strengthens use of OER in classrooms, it also indicates promise in student persistence and success.

Student & Faculty Perceptions of OER. Various types of postsecondary institutions—community colleges, four-year universities, research universities, etc. offer programs and courses requiring course materials. Although, as both students and faculty become more and more familiar with the term 'open educational resources' a lack of awareness still remains. Three of our articles highlight student and faculty perceptions of OER usage.

The first article, *A Study of STEM Usage and Perceptions of OER at a Large Research University* by authors Neelam Bharti and Michelle Leonard explore these unique characteristics in STEM programs, specifically, within a large research university context.

Viki Stoupenos' *Perceptions of Quality and Utilization of Open Educational Resources in a Psychology Course,* hones in on a specific course, psychology, and looks how faculty perceive the quality aspect of OER, and subsequent adoption of OER.

The Impact of Typical Textbook Behaviors on Satisfaction with Zero Textbook Cost Materials by authors Daniel R. Albert, Alex Redcay and A. Nicole Pfannenstiel, also examine faculty perceptions and satisfaction with OER—in particular, using Zero Textbook Cost Materials.

OER Course & Curricular Design & Development. *Taking OER to the LIS: Designing and Developing an Open Education Course for Library Science* by Steven J. Bell was an exciting read for me. The topic of this study is long overdue and we are thankful to Steven for paving the way toward OER design and integration within LIS programs.

Another fantastic article, *Students Using OER for Professional and Curricular Development: Lessons from Two Composition Textbooks by authors* Alex Wulff, Christina Branson and Vaughn Anderson, outline the affordances gleaned from the redesign of both face-to-face and online delivered courses using OER. One particular affordance the authors make is the ability to successfully customize new curricula due to their understanding their student population and their unique characteristics.

Faculty adaptation and adoption. Another article by Beth Tillinghast, also breaks new ground in OER research with her study, *Using a Technology Acceptance Model to Analyze Faculty Adoption and Application of Open Educational Resources.* The Technology Acceptance Model (TAM) Model has been widely used to measure levels of faculty technology acceptance; however, Beth adds a new twist by using this model to measure levels of OER adoption and applications.

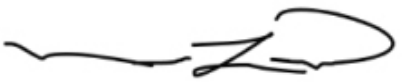
In a similar model-based study, Shouhong Wang's *Adoption and Adaptation of Open Educational Resources: Models of Decision-Making and Action Planning* provides the OER community with valuable information by focusing on the necessary decisions that should be considered as prerequisites toward appropriately planning OER adoption and adaptation.

OER and OEP. *The True and False promise of Open Educational Resources, or, How Open Educational Resources are Condemned to Wither without Open Pedagogy,* by Hamish F. Lutris and Nicolas P. Simon,

The articles in this issue are sure to impress. The articles not only represent conversations on current work within the OER community, but they are also an indicator that these authors are exploring different trajectories for OER research, and to spark OER awareness, growth, and evolution. I sincerely thank these passionate and generous authors for continuing to advance OER knowledge and awareness by sharing their academic scholarship with our *IJOER* readers.

I would also like to thank the *IJOER & Beyond* moderators, peer reviewers, and copyeditors whose labor went into producing *IJOER* and who should not go unrecognized for this collective collaboration.

As always, stay with us and expect more.



Melissa Layne, EdD

Editor-in-Chief, *International Journal of Open Educational Resources*

3 Questions for an OER Leader | Featuring Professor Mpine Makoe

Melissa Layne
American Public University System

Professor Mpine Makoe is the Commonwealth of Learning Chair in Open Education Practices/ Resources and Research Professor in Open Distance eLearning at the University of South Africa (UNISA). She is a National Research Foundation (NRF) rated researcher and an OER Ambassador of the International Council of Distance Education (ICDE). She is also a director of African Council for Distance Education (ACDE). Mpine is a sought after scholar and has published extensively in technology-enhanced learning including mobile learning; staff development; quality and policy formulation in ODel. She has also done consultancy work for the Commonwealth of Learning facilitating the development of ODeL policies in different universities in Africa. She holds a PhD and MSc in Educational Technology from the Open University, UK. She also has an MA in Journalism from the University of Michigan and BA in Communication and English from Hope College in Michigan as well as a diploma in Journalism from Africa Literature Centre in Zambia. Mpine is actively involved in distance education associations nationally, regionally, and internationally and a member of the University Futures Network. She also serves as a higher education expert on the UNESCO (IESALC) Futures of Higher Education 2050 project.

Due to Mpine's extensive work and leadership in Online Learning and Open Education Practices/Resources at UNISA, I think our readers will find both her past and current OEP/OER activities of great interest.

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1 Melissa: You are undoubtedly, very involved in Open Education Pedagogy, and Open Educational Resources. Additionally, the breadth and depth of your work in higher education has led you to direct your focus

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on social injustices by enabling equitability, inclusivity, accessibility, and participation. Can you share more on this focus?

Mpine: *My work in OEP/OER focused mainly on addressing the social injustices that hinders higher education to respond to their mission of producing graduates who will contribute meaningfully to the economic development and the much-desired social cohesion of South Africa's nascent democracy. Societies look up to universities to address an array of problems such as those we are currently facing including persistent inequality, poverty, climate change, social cohesion, inclusive economic development, access to health, housing, water and other basic services. It is from this standpoint that I firmly believe higher education has a social justice mandate of enabling equitable access to quality education to all irrespective of who they are and where they are from. The principles of social justice are grounded on equitability, inclusivity, accessibility and participation with the aim of addressing the injustices that excluded many people from accessing higher education.*

2 **Melissa:** In terms of OEP/OER understanding and adoption, where do you believe we (collectively, higher education) stand and why?

Mpine: *The aim of open education is to provide an unprecedented opportunity to increase student access to higher education at a scale in a cost-effective way. Accomplishing this much needed goal amid rampant poverty requires that higher education institutions should lead the way by ensuring that education that is produced through public funds is made accessible to the community it serves. It is therefore important that Open Education is viewed beyond what it does to what it is meant to achieve. Despite well-meaning efforts and obvious benefits for using OEP/OER, many institutions of higher learning are reluctant to embrace these practices. Challenges confronting OEP and the use of OERs range from lack of empirical studies that focus on the pedagogies, theories and the impact of OEP/OER in addressing the social mandate of open education institutions such as Unisa. Although ODL institutions have been successful in enabling access to higher education, they have been weak in ensuring that students are effectively supported to succeed. Access without success is not an opportunity. This perception of poor throughput rates that is often associated with open and distance education has also polluted all other open education practices.*

3 **Melissa:** Due to the COVID-19 pandemic, higher education around the world has only just started to respond to the necessity to place courses online. As leaders in Open Distance Learning (ODL), Unisa has successfully adapted, endured, and survived these ever-evolving changes in higher education. For example, COVID forced nearly 1.6 billion South African children and youth to stay at home and has impacted student learning loss and increasing drop-out rates. Responding to these issues, you developed a pilot initiative using OER that enabled 300 school teachers to transition from face-to-face to online teaching and learn-

ing. Please share with our readers more about this initiative.

Mpine: *My role as a CoL chair and as an OER ambassador for the International Council for Distance Education (ICDE) is to promote OEP/OER by focusing particularly on the social justice mandate of higher education; influence policies by ensuring that OEP/OER are part of the national discourse; thrash out professional development programmes in the creation, adaptation and use of OERs; develop and undertake collaborative research project on OEPs/OER. The rational for promoting open education-based model has proved to be efficient in expanding access into higher education by providing educational content at no or low costs. When Covid-19 pandemic hit the world, many institutions had to move very quickly to an online space, mostly in a haphazard way as the pandemic caught many people unaware. Many teachers who were already teaching in the field were expected to move their classroom to an online environment seamlessly despite their little or total lack of capacity to teach online. To address the challenge of capacitating educators at a scale and in a very short time, my colleagues and I designed a programme on equipping in-service teachers with the necessary skills they need to teach online. Since there was no time to properly design an online course, we used OER to assist teachers to develop a working understanding of teaching online. To support participants in navigating the online space, WhatsApp was selected because it is a familiar social network platform that is user-friendly, easily accessible and generally available on mobile phones. WhatsApp was used by students to readily share and help each other as they go through the OER, while academics connected with WhatsApp groups daily to gauge learning, pose or answer questions, and provide an overall level of support to maintain, motivate and connect with students. This OER based course reached more than 600 participants in three months, others went as far as completing the course and receiving badges.*

Open education practices and models have thus far proved to be efficient in expanding access into higher education. The success of open education is dependent upon systematic approaches to planning and managing the implementation of these practices. It requires flexible structures that enable access to as many people as possible using a variety of routes that are both formal and non-formal, conventional and unconventional. The increased digitalisation of education and the impact of Covid-19 will lead to new ways of doing things in higher education. It is therefore the task of higher education institutions to create learning opportunities that meet possible future requirements for teaching and learning, as well as the development of systems and structures needed to support it. Institutions that are going to succeed are those that are prepared to move beyond their comfort zone and explore innovative ways of collaborating with other stakeholders in search for present-day as well as futuristic solutions with global appeal. Ω

Unisa Facts and Figures

- Founded in 1873 as the University of the Cape of Good Hope, the institution became the first public university in the world to teach exclusively by means of distance education in 1946 ("About," Unisa website, 2021)
- The University of South Africa (Unisa) "is the largest open distance learning institution in Africa, the longest standing dedicated distance education university in the world.
- Unisa enrolls nearly 400,000 students in South African and other parts of the world" ("Facts & Figures," Unisa website, 2021) students.
- Over 50,000 students obtain certificates, diplomas, and degrees annually from over 500 programs to choose.
- Unisa offers short courses and certificate programs, to three-and four-year degrees and diplomas.
- Staff Statistics Staff ("About," Unisa website, 2021)

  Number of employees

	2017	Increase	2016	Increase	2015
Number of permanent employees	5 762	10.74%	5 203	7.32%	4 848
Number of fixed-term employees	1 234	5.56%	1 126	22.39%	920

  Overview of admin/support staff

OVERALL	A	C	I	W	A	C	I	W	Foreign Nationals FM	Foreign Nationals FF	Totals
HEADCOUNT DEC 2017	2215	88	74	546	2592	116	120	998	165	92	7006
DEC 2017%	31.6	1.3	1.1	7.8	37.0	1.7	1.7	14.2	2.4	1.3	100.0
TARGET FOR 2017	43.4	2.3	1.1	7.6	28.3	0.8	1.3	12.0			

  * The figures presented are based on data extracted from the Unisa 2017 Annual Report.

- African students and females make up the bulk of the institution's student population. Most students are between the ages of 18 and 24.

The Interaction of Open Educational Resources (OER) Use and Course Difficulty on Student Course Grades in a Community College

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Virginia Clinton-Lissel
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Abstract

Students report that not being able to afford course materials has adverse academic consequences. It is possible that this would be more problematic in relatively more difficult courses. Open Educational Resources (OER) are teaching and learning materials that are openly licensed and often available at low or no cost to students. This study examined the interaction between OER use through a campus zero textbook cost (ZTC) initiative and course difficulty on student course grades from 35 different courses at a community college while controlling for student gender, previous grade point average, and Pell grant eligibility status. Although the main effect of increasing course difficulty is decreasing individual students' grades, there was a significant interaction between OER use and course difficulty. Student grades in sections using OER declined at a lower rate compared to the decline in student grades in sections without OER use. The findings indicate that one particular context, course difficulty, may be important for understanding the efficacy of OER adoption.

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Keywords: Zero textbook cost, open education resources (OER), course difficulty, student grades

La interacción del uso de recursos educativos abiertos (REA) y la dificultad del curso en las calificaciones de los cursos de los estudiantes en un colegio comunitario

Resumen

Los estudiantes informan que no poder pagar los materiales del curso tiene consecuencias académicas adversas. Es posible que esto sea más problemático en cursos relativamente más difíciles. Los Recursos Educativos Abiertos (REA) son materiales de enseñanza y aprendizaje que tienen licencia abierta y, a menudo, están disponibles a bajo costo o sin costo para los estudiantes. Este estudio examinó la interacción entre el uso de REA a través de una iniciativa de costo cero de libros de texto (ZTC) del campus y la dificultad del curso en las calificaciones de los cursos de los estudiantes de 35 cursos diferentes en un colegio comunitario mientras se controla el género del estudiante, el promedio de calificaciones anterior y el estado de elegibilidad de la subvención Pell. Aunque el efecto principal de aumentar la dificultad del curso es la disminución de las calificaciones de los estudiantes individuales, hubo una interacción significativa entre el uso de REA y la dificultad del curso. Las calificaciones de los estudiantes en las secciones que usan REA disminuyeron a un ritmo menor en comparación con la disminución en las calificaciones de los estudiantes en las secciones sin uso de REA. Los hallazgos indican que un contexto particular, la dificultad del curso, puede ser importante para comprender la eficacia de la adopción de REA.

Palabras clave: Cero costo de libros de texto, recursos educativos abiertos (REA), dificultad del curso, calificaciones de los estudiantes

开放教育资源（OER）使用和课程难度的交互作用对社区大学学生课程成绩产生的影响

摘要

据学生报告，无法负担课程材料对学业具有消极影响。这一情况在相对困难的课程中可能会更麻烦。开放教育资源

（OER）是取得开放许可的、用于教学和学习的材料，通常以低成本或零成本形式提供给学生。本研究分析了OER使用（源自一项校园零课本费用倡议）与课程难度之间的交互作用对一所社区大学35门不同课程的学生课程成绩产生的影响，并对一系列因素加以控制，包括学生性别、以往平均学分绩点、和佩尔助学金资格。尽管课程难度加大的主要影响是个别学生成绩下降，但OER使用和课程难度之间存在显著交互作用。使用OER的课程中学生成绩下降率低于未使用OER的课程。研究发现表明，课程难度这一特定情境可能对理解OER采纳效能而言是重要的。

关键词：零课本费用，开放教育资源（OER），课程难度，学生成绩

Introduction

A community college in Virginia, USA, has developed a ZTC degree in which it is possible to complete all coursework for the degree with zero textbook costs. The term *ZTC* simply emerged from how sections of courses are listed in the course schedule. Some sections of courses require a commercial textbook and some sections of the same courses utilize OER. Sections that use OER are labeled in the schedule with a lowercase "z" beside the section number. Because many courses have multiple sections - some which require either commercial textbooks and some which use OER, it is possible to analyze potential differences in outcomes controlling for student attributes and estimating interaction effects with course attributes such as course difficulty. This study was conducted to test such course outcomes and interactions.

Review of Literature

Most college instructors require students in their courses to obtain learning materials (Seaman & Seaman, 2017), and the price of commercial learning materials, particularly textbooks, has increased dramatically in the past few decades (US Bureau of Labor Statistics, 2016). An alternative to expensive commercial materials are Open Educational Resources (OER), which include a variety of available learning materials such as textbooks, music, and videos that are licensed without access fees (Butcher, 2015) and are openly licensed for retention, reuse, revision, remixing and redistribution.

The COUP framework (i.e., Cost, Outcomes, Usage, and Perceptions) has been used to evaluate OER (Bliss et al., 2013). Beyond estimates of costs and savings (C), usage (U), and perception

(P), a critical aspect to consider are the outcomes (O). If students save money, usage is widespread and nuanced, and perception is favorable, but student learning is not on par with the use of traditional textbooks, then the benefit of OER is diminished.

Most studies of OER outcomes have shown that courses using OER have comparable learning outcomes with courses using traditional textbooks (e.g., Clinton & Kahn, 2019). Sometimes the outcomes for OER are better and occasionally they are worse. Reviews by Hilton (2016, 2019) concluded that students generally achieved the same learning outcomes in classes with OER, compared with students in classes with non-OER. Robinson (2015) utilized a quasi-experimental design to compare student learning outcomes between sections in the treatment group (OER) and sections in the control group (non-OER) among seven different courses. Overall, five sections using OER showed similar or better outcomes than sections of the same courses using traditional textbooks. Two sections of courses showed better outcomes using traditional textbooks. The same mixed pattern can be also found in a multi-institutional study by Fischer et al. (2015). The authors utilized propensity score matching to control for age, gender, and minority status in 15 courses. Each course had sections that used either a traditional textbook or OER. The majority of courses (10) showed no difference in student grades according to OER vs. traditional textbook used. Four courses showed better grades in OER sections and one course showed better grades in the section using the traditional textbook.

A meta-analysis that aggregated findings from 22 studies with a combined total of over 100,000 students in which OER textbooks were compared to traditional textbooks found that learning outcomes were equivalent (Clinton & Kahn, 2019). However, there was substantial variability across studies in effect sizes of learning outcomes between OER vs. non-OER. All of the studies used quasi-experimental designs with varying levels of control for possible confounds, such as being taught by different instructors. The authors grouped the studies for three potential methodological confounds: whether or not there was the same instructor, whether or not the same learning measurement was used to measure outcomes, and whether or not prior knowledge or academic achievement was accounted for in the findings. The findings on learning outcomes did not vary based on whether those potential confounds were accounted for. Therefore, it is uncertain why there was so much variability in learning outcomes across studies. However, when considering the relatively small effect sizes attributed to textbooks in general (Robinson 2015) and the typically low coefficients of determination, it becomes apparent that variability in student performance is associated with myriad unmeasured covariates.

The access hypothesis provides a useful understanding of the meta-analytic findings on open textbook adoption. According to the access hypothesis, having access to learning materials

would be advantageous to learning outcomes; however, the number of students who would not have access to commercial resources but whose learning would benefit from access is relatively small (Grimaldi et al., 2019). Therefore, the effect of OER adoption on learning outcomes averaged across all students in all courses is likely to be null, as was found in the meta-analysis by Clinton and Kahn (2019). However, Grimaldi and colleagues (2019) commented that it is important to consider how different contexts may vary the outcomes of OER adoption, which is also evident by the large variability in effect sizes in Clinton and Kahn (2019).

One area in which the context interacted with OER adoption on learning outcomes was with student socioeconomic status. Two studies on OER adoption found that students who were eligible for a certain type of financial aid based on low-income status (Pell grants) benefited from OER adoption more than their peers (Colvard et al., 2018; Delgado et al., 2019). This is consistent with the articulation of the access hypothesis by Grimaldi et al. (2019) because students who had less income likely had fewer financial resources for course materials than their peers and may have been less likely to access pricey commercial resources, but could access the OER available without fees. Their peers may have been able to afford the commercial materials and received less benefit from OER adoption because they were able to access both commercial resources and OER.

There has been some examination of different contexts for outcomes of OER adoption. No extant study has examined how course difficulty may relate to OER and student learning outcomes. Approximately one-third of students in a study reported that not having the textbook due to cost had negative academic consequences (Florida Virtual Campus, 2018). Perhaps the use of OER in more "difficult" courses has a differential effect on outcomes because the potential effects of not having a textbook would be greater with more challenging courses. Granted, what is difficult for one student might be quite easy for another. Rather than stereotype departments and courses as difficult or easy, we acknowledge the fit between student interest and talents and the courses they complete. Nevertheless, some reasonable estimate of course difficulty might be important to consider in estimating the outcomes associated with the presence of OER.

Researchers have tried various approaches to estimate course difficulty but have mostly relied on perceptions of students or researchers. Ridley et al. (2003) used the perceived severity of grading standards to estimate intellectual challenge and course difficulty. Similarly, Bassiri et al. (2003) used grading policy in syllabi to estimate course difficulty. Babad et al. (2008) estimated course difficulty by analyzing perceived workload from course syllabi. Interestingly, Ansburg (2001) used student expectations of grade distributions to estimate course difficulty, where the logic was that a course that was of appropriate difficulty would have a negatively skewed distribution of grades. They expected that grades would generally be

on the high end with few low grades in the class. The students' expectation was that more difficult courses would have a normal distribution around a mean of 2.0 with fewer A grades. The idea of using distributions of grades seemed to be a reasonable approach to quantitatively estimate course difficulty. Indeed, Anderson et al. (2018) estimated course difficulty using historical grades and withdrawal rate in two finance courses (two sections each). While the withdrawal rate did not accurately discriminate between the two courses, the historical grade distributions seemed to be an appropriate discriminator. Wladis and Hackey (2014) estimated course difficulty simply by distinguishing between "lower level" courses and "higher level" courses based on the presence of credit-bearing pre-requisites. If a 200-level course had a credit-bearing pre-requisite, it was deemed to have higher difficulty. The authors did not find a significant effect of online versus face-to-face delivery on retention rates in higher level courses.

In addition to examining how OER outcomes may vary depending on context, another area in need of development is controlling for confounding variables. Because of the pragmatic realities of conducting research with college courses, quasi-experiments comparing naturally occurring groups (students enrolled in different courses) are typically the methodology used. This methodological approach allows for ecologically valid comparisons because real students in real courses are examined. However, the lack of random assignment in quasi-experiments limits the likelihood the compared groups were similar in important characteristics such as demographics or prior academic achievement. For these reasons, Clinton's review of OER in psychology courses (2019) called for better control of potential confounds as this lack of control is a valid critique of OER efficacy research (see Griggs & Jackson, 2017; Gurung, 2017). Indeed, Clinton (2018) found that differences in prior academic achievement likely explained differences in learning outcomes when comparing an introduction to psychology course with a traditional textbook to one with an OER textbook. Some studies have controlled for possible confounds. For example, Fischer et al. (2015) used propensity score matching to control for age, gender, and minority status across all courses. In addition, Jhangiani et al. (2018) measured prior knowledge preceding the study and found that students in different courses had comparable background knowledge.

The current study was a test of the interaction between OER and course difficulty in a robust sample of courses and students while controlling for potential confounds. The primary research questions were:

1. *What is the association of textbook type with students' course grades controlling for gender (self-reported), Pell grant eligibility (as a proxy for student socioeconomic status, see Colvard et al., 2018, for a similar approach), prior academic success, and course difficulty?*

2. *Does the association of textbook type*

with students' course grades vary with course difficulty?

Prior academic performance is particularly important to control for because it is such a strong predictor of performance on learning assessments (Cassidy, 2015).

Method

The study was conducted in a community college in Virginia that has adopted an OER-based pedagogy that allows students to earn associate degrees with zero dollars spent on textbooks (DeMarte & Williams, 2015; Wiley, Williams, DeMarte, & Hilton, 2016). Data were obtained from 35 courses, which had both non-OER and OER sections, offered during the summer and fall semesters of 2016. Those courses were taught by 388 instructors. Some of the instructors taught courses or sections in the ZTC degree with OER and also taught courses outside of the ZTC degree with traditional textbooks. The courses included a wide range of subjects including business, mathematics, computer programming, biology, chemistry, history, music, and sports, which was a representative list of courses offered in a community college. Approximately 25,117 course grades were included but with listwise deletion of data based on the eventual covariates considered, 15,633 course grades were considered. Data were extracted from the college's archives.

The dependent variable, Course Grades, estimated students' learning outcomes and were reported on a five-point scale, A, B, C, D, and F (4,3,2,1,0). Five independent variables were included in the study: OER Course (Yes/No), Gender (Male/Female), Pell Eligibility (Yes/No), Course Difficulty (continuous) and Previous GPA (continuous).

OER Course was measured as a binary variable with 1 being OER course and 0 being non-OER course. Self-reported gender in the system was binary, male and female. Pell eligibility (1: eligible; 0: not eligible) and prior GPA were extracted for each student from the college's records. Prior GPA was standardized to a z-score, which has a mean of 0 and standard deviation (*SD*) of 1 (original mean = 2.94; *SD* = 0.78). The course difficulty variable was based on failure rates in the current courses. It was created by calculating the proportion of students achieving a D grade or lower across all sections of each course (e.g., if 80% of students who took the course received a D or lower grades, the difficulty would be 0.8). Course difficulty was then standardized (i.e., standardized difficulty = (raw difficulty – mean difficulty of all courses) / SD of all courses) around the mean failure rate of 0.28 (*SD* = 0.8; Range, 0.08 to 0.43) to render a continuous variable with mean of 0 and *SD* of 1. Hence, the larger the difficulty score, the more difficult the course was, and positive course difficulty scores (i.e., above mean) meant that the course was more difficult than the courses with negative difficulty scores (i.e., below mean).

The purpose of standardizing the two continuous variables (prior GPA and course difficulty) was for inter-

pretability of results. Standardizing the two continuous variables created an interpretable zero-point. The remaining three variables OER use, Pell eligibility, and Male were binary and coded with an interpretable zero. Standardizing the two continuous independent variables made interpretation more consistent with the interpretation of binary variables, that is, the estimated change in the outcome variable if the independent variable (either standardized-continuous or binary)increases by a rational one unit. In addition, standardizing the continuous variable made the interaction effect more interpretable.

Results

Table 1 below show the results of regressing course grade (i.e., dependent variable) on OER, standardized previous GPA, standardized course difficulty, gender, Pell-eligibility, and the interaction between OER and standardized course difficulty (i.e., independent variables and the interaction term). The multiple R equals 0.446 with a coefficient of determination (R^2) of 0.199, which indicates 19.9% of the overall variance in the outcome, course grade, can be explained by the list of independent variables included in this study. The overall model is significant [F (6,15,626) = 646.163, $p < 0.0001$]. The zero-order correlation of OER with course grade was 0.025 which was significant ($p < 0.05$). However, in the presence of all the other predictors, OER was not a significant predictor of course grade ($B = 0.025$, $\beta = 0.005$, $p = 0.469$). All other predictors in the model were significant. Previous GPA is the strongest predictor ($B = 0.605$, $\beta = 0.410$, $p < 0.001$) and accounts for 16.6 percent of the variance in course grade [semi-partial coefficient (0.408) squared = 0.166]. The unstandardized coefficient of 0.605 means that there was a projected 0.605-point increase (in a 5-point grade scale) in student course grades with every unit (i.e., 1 *SD*) increase in student previous GPA, holding other predictors constant. Importantly, the covariate of standardized course difficulty was significant in the presence of the other variables (B = -0.349, β = -0.169, $p < 0.001$); that is a predicted decrease of 0.349 point in student course grades with every unit (i.e., 1 *SD*) increase in course difficulty while holding other predictors constant. This pattern is also consistent with the zero-order correlation between course difficulty and course grade (r = -0.159). Reasonably, the coefficient was negative, meaning that course grades tended to be lower as course difficulty increased. Standardized course difficulty was based on the aggregated failure rate of each course which was based on student course grades. However, because the standardized course difficulty was aggregated across multiple sections for each course and the student course grade was based on individual performance, the zero-order correlation between them was not problematic with only one percent shared variance (r = -0.138, $r^2 = 0.019$). This strategy to estimate course difficulty is recommended as there do not appear to be issues with multicollinearity but does require a large sample of sections and courses.

Most importantly, the interaction between OER and standardized course difficulty was significant ($B = 0.248$, $\beta = 0.039$, $p < 0.001$). The positive valence of the interaction term indicates that although the general trend (main effect) is for course grade to decrease with increased standardized course difficulty, the presence of OER blunts the impact of standardized course difficulty on course grades.

Table 1. *Regression of Course Grade on OER, GPA, Course Difficulty, Gender, Pell and Interaction between OER and Course Difficulty*

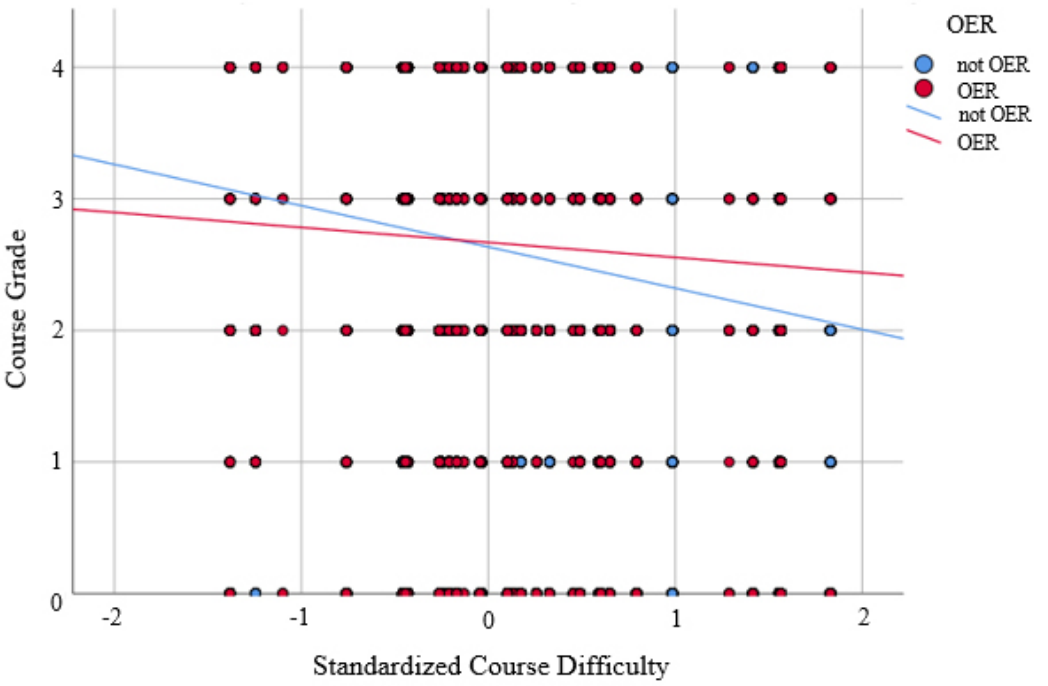
Variable						
	B	β	t	p	Zero-order	Tolerance
Constant	2.713		150.104			
OER course	0.025	0.005	0.724	$p = 0.469$	0.025	0.926
Previous GPA	0.605	0.410	57.009	$p < 0.001$	0.412	0.992
Course Difficulty	-0.349	-0.169	-22.354	$p < 0.001$	-0.159	0.894
Male	-0.054	-0.019	-2.555	$p = 0.011$	-0.065	0.965
Pell Eligibility	-0.151	-0.053	-7.280	$p < 0.001$	-0.040	0.982
OER X DIFF	0.248	0.039	4.943	$p < 0.001$	-0.012	0.842

Figure 1 below illustrates the significantly different slopes of the OER sections versus the non-OER sections using standardized course difficulty to predict course grade. The plot in Figure 1 is at zero-order for simple visualization purposes. However, it is very similar to, and does not distort the image based on the plot of the predicted values that accounts for all the covariates in the model. As seen in Figure 1, the negative slope of the OER course is less severe than the negative slope of the non-OER courses.

Discussion

The purpose of this study was to examine potential interactions between course difficulty and OER adoption on student grades. In addressing this purpose, we controlled for several potential confounds as recommended in Clinton and Kahn's (2019) meta-analysis while examining 15,633 course grades across 35 different college courses. Specifically, we controlled for self-reported gender, Pell eligibility, and importantly, previous academic performance. There was indeed an interaction

Figure 1. *Zero Order Plot of Interaction Between OER and Course Difficulty*



between OER use and course difficulty on student grades in that OER adoption appeared to lessen the negative relationship between course difficulty and final grades.

To address this study's purpose, we calculated the unique measure of course difficulty based on the proportion of students who earned a D or F in each course. Because the study included multiple sections of many courses over multiple semesters, the calculation of current failure rate is arguably logical and stable. While course difficulty was ultimately dependent on individuals' course grades, the aggregation of failure rate across many sections and semesters did not result in undue multicollinearity, likely because of the large sample size involved.

The most important novel finding in this study, however, is the significant interaction between course difficulty and OER. The interaction term emerged in the presence of controlling for several potential confounds which typically "consume" available variance in multiple regression models predicting course grades. Finally, the interaction term emerged in the presence of a most powerful predictor, past student achievement. One potential explanation for this is that students' need for course materials to perform well in a course may increase with course difficulty. In other words, it is possible that students are able to manage in less difficult courses without access to course materials, but for the more difficult courses they need support beyond what is pro-

vided by attending class and other freely available resources. This explanation is not something we are able to specifically test in our dataset but is supported by previous research findings in which students reported that not being able to afford course materials had negative academic consequences (Florida Virtual Campus, 2018). The access hypothesis applies here in that the students in difficult courses who may have needed course materials, but perhaps could not afford commercial materials, benefited from access to OER (Grimaldi et al., 2019). Moreover, the findings from this study indicate that one particular context—course difficulty—may potentially explain the variability in study finding's in Clinton and Kahn's (2019) meta-analysis.

Finding that OER blunts the expected negative main effect of course difficulty on course grades is very hopeful. Whatever conditions exist in courses (instructor rigor, workload, speed of instruction, concreteness or abstractness of content, match between student interest/aptitude and content, instructor experience and effectiveness, or any other predictors) were subsumed parsimoniously, empirically, and quantitatively in the aggregated course failure rate. No causal claims are made, but prediction is powerful enough to justify gambling that OER used in historically difficult (higher failure rate) courses might blunt the negative trend. Certainly, the trend was not reversed. Difficult courses still tend to result in generally lower grades, but the presence of OER might make that phenomenon less so with zero cost to students.

The difficult courses are by definition are more challenging for students. In addition to OER use, other pedagogical interventions may be considered in future investigations in order to promote student learning in difficult courses, such as collaborative learning, providing more formative feedback to students, or promoting student motivations in the course.

While the zero-order correlation between OER and course grade was positive and significant (due to the large sample size), its beta-weight in the overall model was not significant. Controlling for gender, Pell eligibility, previous academic success and course difficulty diminished the weak positive association between OER and student outcomes. Even so, the zero-order result, as weak as it was, and the null result in the overall regression model still support the use of OER. This is not necessarily because of improved student achievement but on the grounds that student achievement using OER is on par with student achievement using traditional textbooks with zero costs to students. This null finding is the most frequently reported outcome (see Hilton 2016, 2019). OER produces similar results at diminished financial costs to our most financially vulnerable students.

Conclusion

Previous research findings have shown that OER provide students with similar learning outcomes as commercial materials at a greatly reduced cost (Clinton & Kahn,

2019; Hilton 2016, 2019). However, the efficacy of OER based on allowing students access to materials likely varies by context such as course, institution, and student characteristics (Grimaldi et al., 2019). In this study, we examined the potential context of course difficulty and found an interaction with OER use on course grades. Grades declined less with course difficulty when OER were used compared to when OER were not used. These findings are useful for instructors and institutions who may be considering OER adoption or methods of improving student grades in difficult courses.

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A Study of STEM Usage and Perceptions of OER at a Large Research University

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Abstract

Image: Courtesy of Jaredd Craig

Academic librarians have a unique opportunity to build high-impact collections to support an institution's curriculum and research with the broad spectrum of OER and to be in a position to offer guidance on its availability, accessibility, and usability. To build a sustainable OER collection in any medium for STEM disciplines, librarians must first identify user needs in supporting curriculum and research through various collection management practices. For example, an assessment to demonstrate such needs can be conducted where students and faculty provide both qualitative and quantitative responses, which can guide the creation of an OER collection where user needs are considered using a *just-in-time* approach. This paper attempts to look at the awareness, acceptance, and use of OER on the University of Florida campus among STEM patrons and how libraries can facilitate to build and promote OERs. We conducted a usage and perception survey among the STEM faculty, researchers, and students for research and teaching. The results of the survey revealed that faculty and students acknowledge the importance of OER in both research/scholarly activities and instruction, but there is a big part of the faculty and student community that is unaware of OER content and its access. The majority of respondents do not know that the libraries offer OER collections through the UF library catalog. We suggested some strategies libraries can consider to support and promote the use of OER in the classroom and research and make it more easily accessible through various facets.

Keywords: Open educational resources (OER), perception, teaching, research

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Un estudio del uso de CTIM y las percepciones de los REA en una gran universidad de investigación

Resumen

Los bibliotecarios académicos tienen una oportunidad única de crear colecciones de alto impacto para respaldar el plan de estudios y la investigación de una institución con el amplio espectro de REA y estar en condiciones de ofrecer orientación sobre su disponibilidad, accesibilidad y usabilidad. Para construir una colección de REA sostenible en cualquier medio para las disciplinas CTIM, los bibliotecarios primero deben identificar las necesidades de los usuarios para respaldar el plan de estudios y la investigación a través de diversas prácticas de gestión de colecciones. Por ejemplo, se puede realizar una evaluación para demostrar tales necesidades donde los estudiantes y el profesorado brinden respuestas tanto cualitativas como cuantitativas, que pueden guiar la creación de una colección de REA donde las necesidades de los usuarios se consideran utilizando un enfoque justo a tiempo. Este documento intenta analizar el conocimiento, la aceptación y el uso de REA en el campus de la Universidad de Florida entre los usuarios de CTIM y cómo las bibliotecas pueden facilitar la creación y promoción de REA. Realizamos una encuesta de uso y percepción entre los profesores, investigadores y estudiantes de CTIM para la investigación y la docencia. Los resultados de la encuesta revelaron que los profesores y los estudiantes reconocen la importancia de los REA tanto en la investigación / actividades académicas como en la instrucción, pero hay una gran parte de la comunidad de profesores y estudiantes que desconoce el contenido de los REA y su acceso. La mayoría de los encuestados desconoce que las bibliotecas ofrecen colecciones de REA a través del catálogo de la biblioteca de la UF. Sugerimos algunas estrategias que las bibliotecas pueden considerar para apoyar y promover el uso de REA en el aula y la investigación y hacerlo más fácilmente accesible a través de varias facetas.

Palabras clave: Recursos educativos abiertos (REA), percepción, docencia, investigación

一所大型研究型大学中STEM学科的OER使用和感知研究

摘要

借助广泛的开放教育资源（OER），学术图书馆员有独特机会创建具有高影响力的馆藏，以及支持机构课程和研究，并能够指导OER的可用性、可获取性和使用性。为建立一个用于STEM学科的可持续OER馆藏（不限形式），图书馆员必须在通过不同馆藏管理实践支持课程和研究的过程中首先识别用户需求。比如，在学生和教师提供定性和定量反馈的情况下实施评估方法证明这类需求，这能指导建立一个以“及时”（*just-in-time*）方法考虑用户需求的OER馆藏。本文试图研究佛罗里达大学校园中STEM支持者在OER方面的意识、接受度和使用，以及图书馆如何能促进建立并推广OERs。我们对STEM教师、研究者和学生进行了一项有关OER使用及感知的调查。调查结果显示，教师和学生承认OER在研究/学术活动及教学中的重要性，但很大一部分教师和学生不了解OER内容及其获取。大多数调查对象不知道佛罗里达大学的馆藏目录会提供OER馆藏。我们为图书馆提出相关策略，以期支持和推广OER在课堂和研究中的使用，并通过多种方法提高OER的可获取性。

关键词：开放教育资源（OER），感知，教学，研究

Introduction

Fig. 1: Types of Open Educational Resources

The recent COVID-19 pandemic presented an urgent need for access to openly available educational resources; higher education administrators, libraries, and faculty need to engage in a serious conversation about freely available educational resources. At the institutional level, administrators are seeking solutions to reduce the high cost of textbooks and journal subscriptions to alleviate the financial restrain triggered by the pandemic. One idea is to use various open educational resources to replace tradi-

tional textbooks used in the curriculum and open access journals. It is important to take a step back and define OER in order to avoid ambiguity. One of the best and most broad definitions comes from The Hewlett Foundation: "*OER are 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. OER include full courses, course materials, modules, textbooks, streaming videos, tests, software, and any other tools, materials, or techniques used to support access to knowledge*" (The Hewlett Foundation, 2016).

By adopting this broad OER definition, libraries and institutions can form new partnerships to reduce textbook and research material cost where applicable, collaborate on identifying the best choices for curriculum/research support based on the content and integrity of the source materials, accessibility, and the reduction of the amount of educational materials paid for by the students (i.e. textbooks), libraries (i.e. purchases for course reserves/journal subscriptions), and institutions (i.e. reduction of fees for students).

Yet, a challenge facing academic librarians is the need to navigate the conversation at institutional administrative levels since many of these OER decisions are made in collaboration with online learning units, campus bookstores, etc. Among several success cases, the University of South Florida Libraries case is unique; it demonstrates a growing partnership with its institution by supporting its Textbook Affordability Project (University of South Florida Libraries, 2017).

The University of Florida is working towards providing OER accessibility to the instructors, students, and researchers. To achieve this goal, assessing the OER knowledge, perceptions, and experience of the campus stakeholders was the first step. This paper focuses on a survey developed by the Marston Science Library librarians at the University of Florida. The survey was administered to assess perceptions and use of OER among faculty, researchers, and students in STEM discipline colleges. The objectives of the survey are divided into several categories: 1) demographics; 2) level of knowledge on OER; 3) use of OER in instruction; 4) use of OER in research, and; 5) knowledge of library support. The survey aims to understand the users' knowledge, perceptions, and experiences using open educational resources for teaching and/or research initiatives at the UF campus.

Literature Review

The Open Educational Resources vision was initiated by a UNESCO forum in 2002 to enable the creation of free, universally accessible educational materials, which anyone could use for teaching or learning purposes. It was defined as, "the open provision of educational resources, enabled by information and communication technologies, for consultation, use, and adaptation by a community of users for non-commercial purposes" (UNESCO 2002, p. 24). Since then, many OERs have been created and licensed under

a Creative Commons license. The Minnesota Open book library, Washington State's Open Course Library, The Saylor Foundation, Affordable Learning Georgia, and open access journals are some of these unique resources. Although the number of OER's continues to increase, the acceptance of these resources in higher education remains in question and needs to be assessed. While valuable, many studies have examined the perceptions of faculty and researchers using anything they considered to be OER at many different levels (de los Arcos et al. 2016, Bliss et al. 2013, and Hilton 2016). Here, we will focus on literature documenting faculty perceptions of OER in higher education. Young (2015) presented a study regarding faculty perception and the use of OER in teaching and reported mixed responses. In Young's study, there existed a lack of available resources, time to locate OER, and upper-level course material was also sparse. Hilton (2020) published a synthesis of studies from twenty OER perception studies involving students and faculty. He concluded that most of the faculty and students who have used OER had a positive experience (Hilton, 2020). In another similar study, Warner studied various HBCU faculty perceptions of OER; Warner used the COUP assessment (Cost, Outcomes, Usages, and Perception) and concluded that faculty reported positive perceptions of OER (Warner, 2020). In two separate studies, Fine and Read (2020) and Lin (2019) examined factors influencing students' perceptions of OER and the impact of OER on students. They identified that pedagogical use of OER increased students' access to education and fostered the development of self-directed skills and copyright awareness. Yuan (2019) developed an OER evaluation rubric to study the perceptions of OER among teaching and non-teaching personnel. Not surprisingly, teachers gave a higher rating to the OER in comparison to the non-teacher participants using the evaluation rubric. In a study by Morris-Babb and Henderson (2012) 2,707 faculty and administrators were asked to assess their familiarity with the OER in Florida. Most survey responders stated their unfamiliarity with OER textbooks. In a similar study reported by Murphy (2013), the survey results from 110 individuals from higher education worldwide indicate that although educators were interested in OER, they face challenges using them. The greatest challenge described was the lack of dedicated information about the OER support and the cost for redeveloping courses (Murphy 2013). These findings were similar to the study reported by McKerlich et al. (2013); the use and creation of OER were measured at the Athabasca University. Many of the faculty and staff who were surveyed (43%) accepted using OER, and 31% supported OER resource creation. Creating and supporting OER is important, but for faculty, students, and researchers to use OER, they not only need to be aware of the resources but also need to trust the quality of the resources (Allen & Seaman 2016). A seminal body of work the national study conducted by the Babson Survey Research Group states that "*most higher education faculty are unaware of open educational*

resources (OER)—but they are interested, and some are willing to give it a try" (Allen & Seaman 2016). However, according to their survey, fewer than 7% of faculty accepted using OER in their classroom. This is still relevant as a report published by Spilovoy, Seaman, & Ralph (2020) indicates; OER adoption is on the rise, and faculty and institution have shown increasing awareness and acceptance of OER but continue to struggle with unfamiliar with OER are, or how to utilize them. Faculty who are aware of OER are much more likely to include them in the curriculum. The report also mentioned, "The impact of awareness of OER initiatives on adoption remains consistent across types of institutions (two- and four-year), the level, of course, being taught, and across regional compacts in the U.S." (Spilovoy, Seaman, & Ralph (2020). K-12 school districts are skeptical about OER use; it makes only a small fraction of the resources used, although those who use OER, they rate the overall quality slightly better than commercial alternatives (Seaman & Seaman, 2020)

One driving force of OER is the Affordable CollegeTextbook Act (H.R.2017/S.1036) that seeks to expand the use open textbooks including open education resources to reduce the cost of traditional textbooks by offering alternative solutions. The H.R. 2017 Summary read in 2019 states: *"This bill directs the Department of Education to make grants to institutions of higher education or states to support projects that expand the use of open textbooks in order to achieve savings for students while maintaining or improving instruction and student learning outcomes. An open textbook is an educational resource that either resides in the public domain or has been released under an intellectual license that permits its free use, reuse, modification, and sharing with others."* Many states have passed their own versions of textbook affordability and this initiative is supported by the Association of Research Libraries, Association of College & Reseach Libraries and other academic assocations. While there is support for this initiative, there are many challenges for this movement to be successful. Wang et al. (2017) described the challenges of OER adoption in higher education. Lack of awareness and lack of confidence in the technical and pedagogical quality and ownership questions were cited as the primary concerns. Many academic libraries are promoting OER using various strategies. Nann et al. shared their experience of promoting OER on two different campuses, the University of Central Florida and the University of San Diego. The main finding was that they need to educate stakeholders through continuous outreach for a successful promotional strategy (Nann et al., 2016). Allen et al. (2014) published a report on opening the curriculum and perception of OER in US higher education by examining faculty attitudes about OERs and how these attitudes changed over time. Results from the survey taken by 2,144 faculty revealed a) they were not aware of OER and its concept; b) OER awareness was not a prerequisite to OER adoption; c) OER were used for course content; and remarkably d) the quality of OER was considered roughly equiv-

alent to traditional sources. A most significant barrier to OER adoption was the requirement of time and effort to evaluate it (Allen et al., 2014). In a similar study with similar results, Jung et al. (2017) administered a survey on faculty use, perceptions, and quality of OER and found that most faculty perceived the OpenStax textbook's quality as the same as a traditional textbook. Today the U.S. Department of Education Office of Post Secondary Education offers a competitive grant "Open Textbook' Pilot" (OTP) program. The goal of this grant is to develop open textbooks or to expand the use of open textbooks for high enrollment courses. The result would be cost savings passed down to students.

Methodology

To assess the perceptions of OER, an online survey comprising 11 questions was distributed to STEM faculty, researchers, graduate students, and visiting scholars to determine their knowledge and use of OER in teaching and research and OER acceptability and popularity within disciplines at the University of Florida. The survey initially included four groups: 1) faculty, 2) staff scientists (engineers, extension research center agents, and scientists), 3) graduate students, and 4) visiting scholars from four colleges, [College of Agricultural & Life Sciences (CALS), College of Design, Construction & Planning (CDCP), Herbert Wertheim College of Engineering (HWCOE), and the College of Liberal Arts & Sciences (CLAS)]. Due to the low response rates of groups 2 and 4, the authors decided to combine the responses of the faculty (n=73) and the researcher/scientist/extension agent/engineer (n=7), and visiting scholar (n=1).

In addition to the demographical questions, nine questions included in the survey focused on understanding user experience in using open educational resources for teaching and/or research initiatives. The authors posit that the UF community uses OER differently for teaching/curriculum support and their research activities.

Results and Discussions

The demographic responses from both questions are combined for status and affiliation. The responders self-identified as researcher / faculty /scientists, student/postdoc, and stated their affiliation with STEM colleges (Fig. 2). Most responses tied themselves to the CALS, where students and faculty seem equally enthusiastic about the survey.

When surveyed about their level of knowledge of OER, the majority of respondents (n=46) believe they have an average understanding of OER (Fig. 3). Significantly few respondents indicated they have a far above average (n=5), followed by a somewhat above average (n=13) knowledge. This is followed by a combined slightly below average (n=32) and far below average (n=17). At every level, the faculty had more knowledge of OER than students. (Fig. 3).

While the current trend with OER in higher education focuses on the

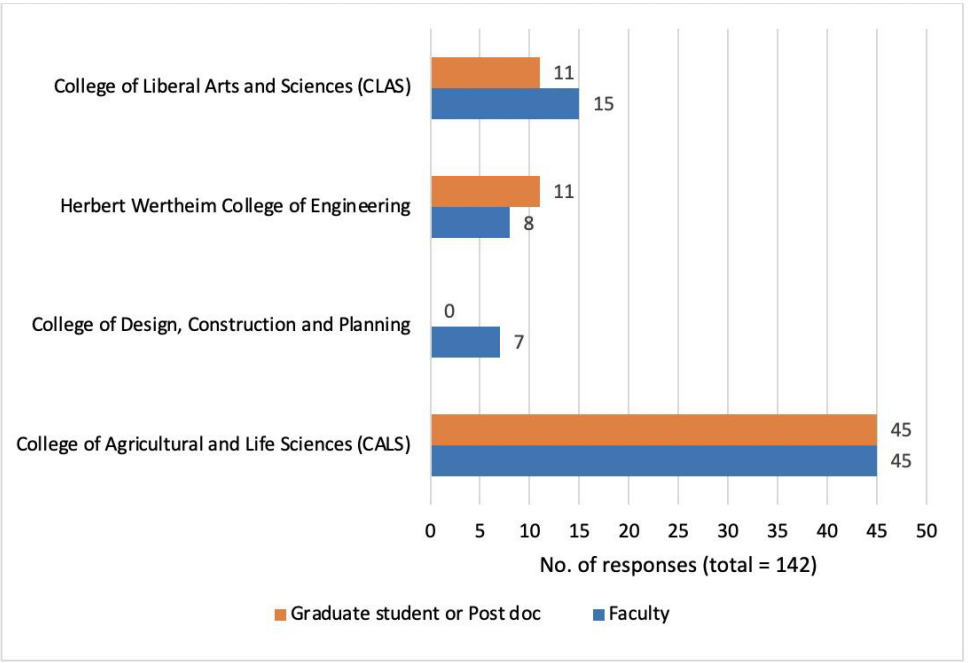

Fig. 2. Demographics of survey responders

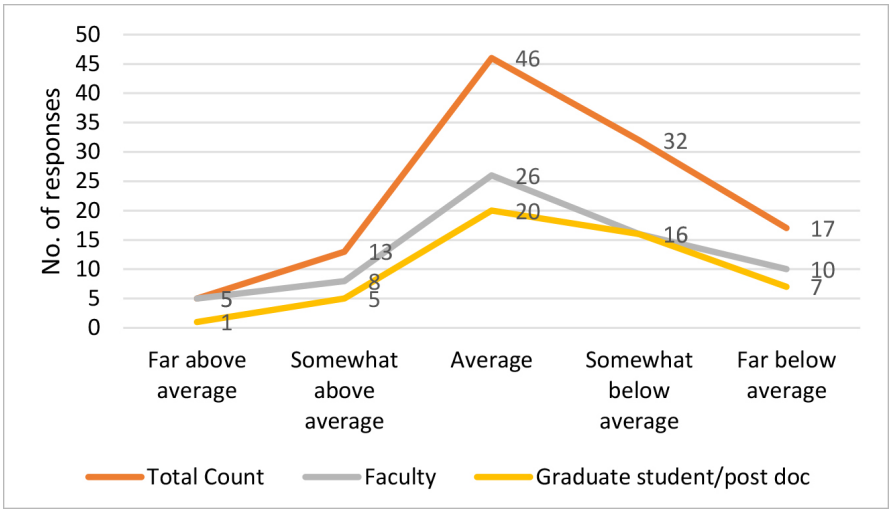

Fig. 3. Level of knowledge of OER

cost of textbooks and research material, this survey focuses on how faculty and graduate students use OER in their curriculum and research.

When using OER for instruction, students were way ahead of the faculty (Fig. 4). Open Access articles are the most widely used OER by both faculty and graduate students. Graduate students were also the leading users of the open textbook and opensource software applications. One explana-

tion could be the drive for using Lynda.com and GitHub; more courses are using Open Source Software (OSS) for statistical purposes. Graduate students/postdocs readily use streaming videos for instructional purposes. It is difficult to ascertain why more faculty are not using this medium; perhaps it is a lack of awareness or due to the difficulty of knowing where to locate such materials.

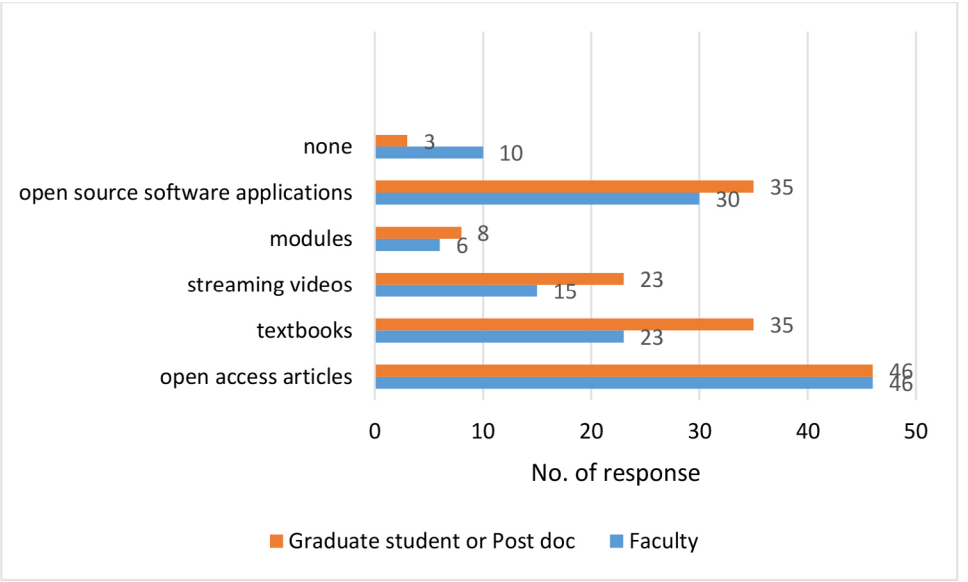

Fig. 4. Use of OER for instruction

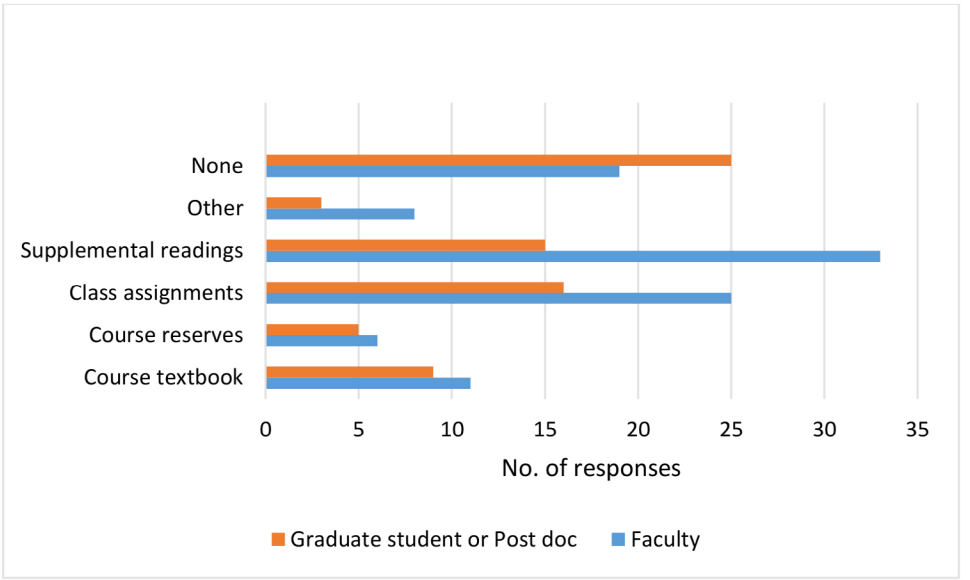

Fig. 5. How OER is incorporated into instructions

Contrasting the use of OER in instruction, the incorporation of OER in instruction told a different story. There is a considerable percentage of respondents who choose not to incorporate OER into instruction at all. Among the users, faculty members lead the charge by incorporating OER into instruction (Fig. 5). For faculty, the high use of OER materials is primarily for supplemental readings and class assignments, which is higher than the OER materials used by graduate students and postdocs for class assignments and supplement reading. Faculty and students also use OER for course reserves and course textbooks.

We also asked about any potential barriers to not using OER, specifically in the curriculum (Fig. 6). The lack of time to review OER content and the unfamiliarity of the subject content that is found in OER materials were two significant barriers for the faculty. All barriers mentioned were personal/professional. We were surprised to learn that no faculty mentioned the departmental approval as an obstacle, which proves that awareness about OER can promote its use without administrative hindrance.

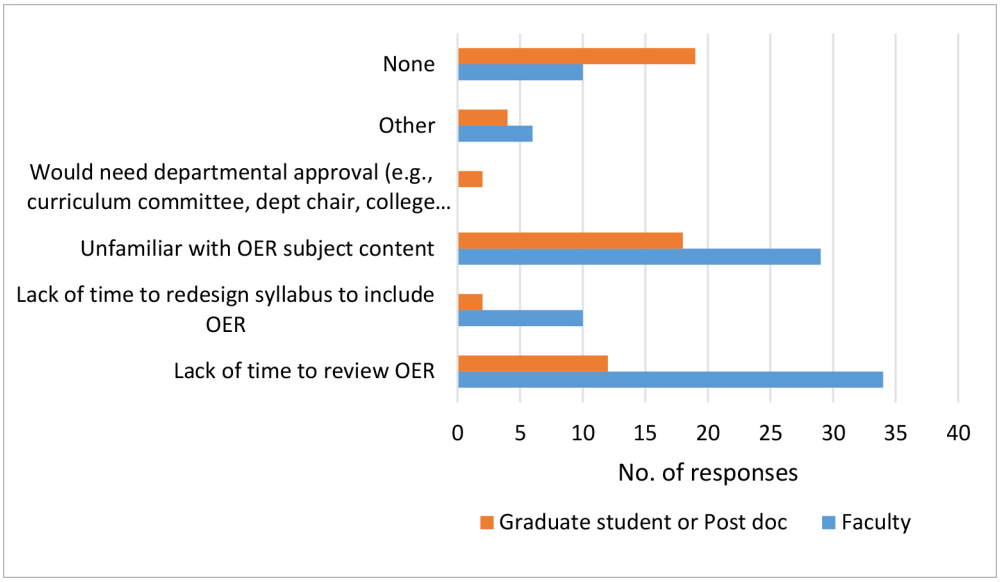

Fig. 6. Barriers for OER use in the curriculum

Also explored in the survey was how faculty and graduate students/ post-docs use OER in various colleges in their research. Although most of the respondents identified in CLAS, they also represent the demographic that uses OER most frequently for research. Not surprisingly, OA articles rank the highest, with some modules ranking the lowest (Fig. 7 & Fig. 8). This was not surprising as it confirms again that the faculty and students use open access articles for teaching and research (Fig. 4).

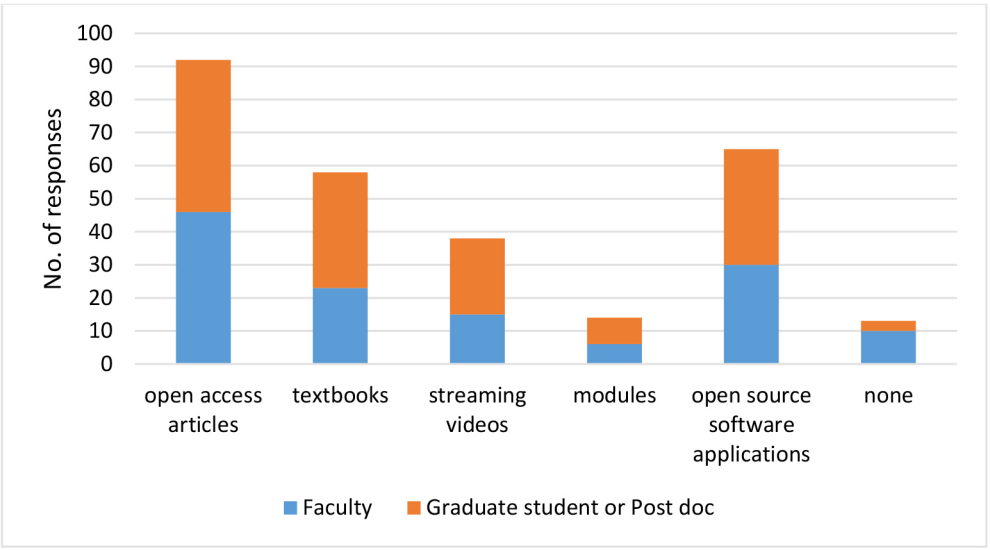

Fig. 7. Types of OER use in research

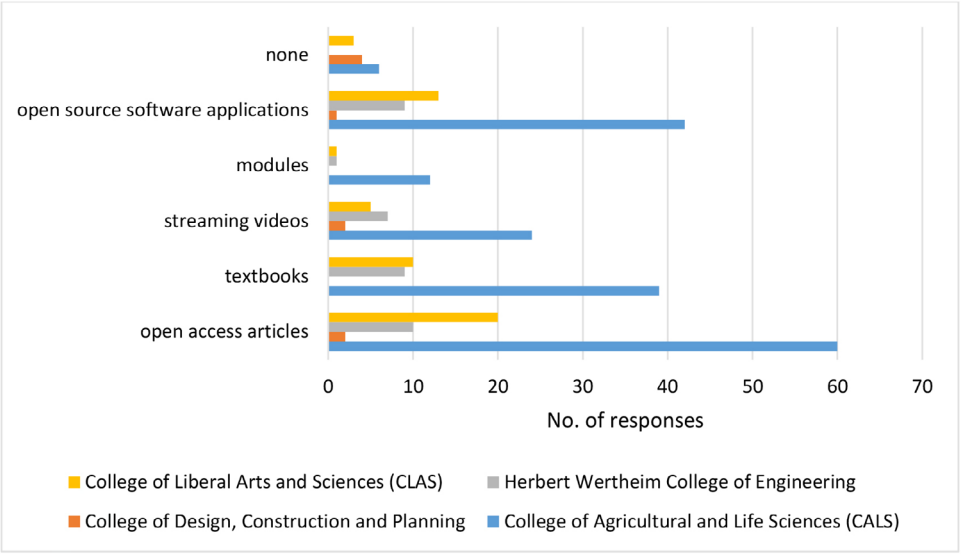

Fig. 8. Types of OER use in research by College

We also focused on how the respondents incorporate OER in their research and other scholarly activities, excluding instruction. The majority of faculty use OER materials in publishing books and journals (n=35), followed by citing in their grant activities (n=24) (Fig. 9).

The majority of graduate students incorporate OER materials into their thesis or dissertation (n=32), followed by publishing (n=28) (Fig. 10). A small number of students use OER for publishing directly on the web.

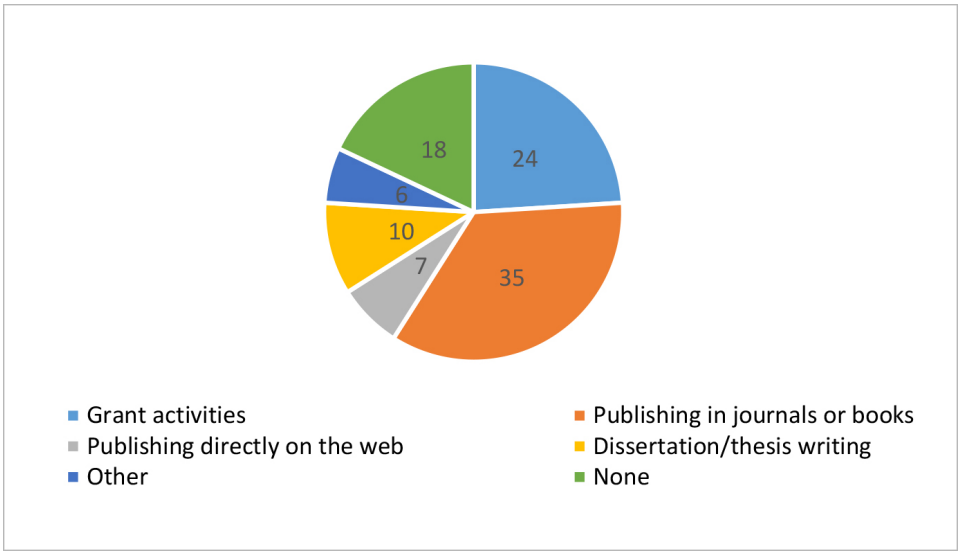

Fig. 9. Faculty use of OER in their research

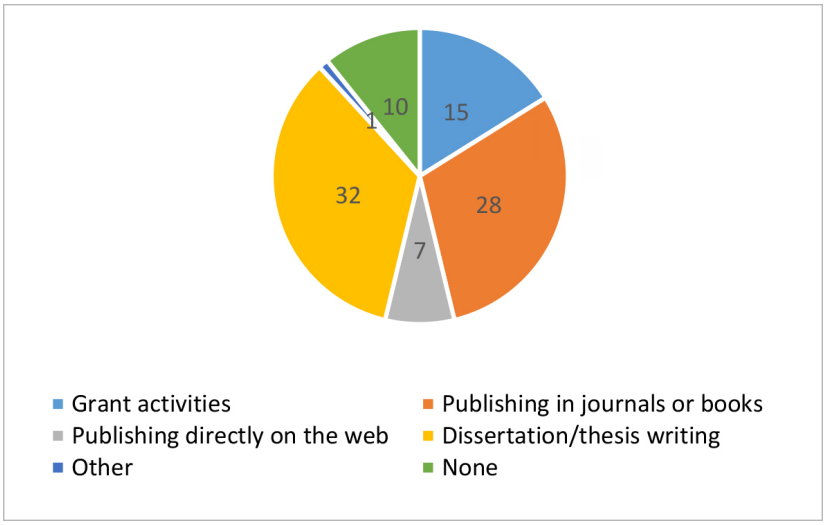

Fig.10. Graduate student/Postdoc use of OER in their research

One of the most critical questions we asked was why they use OER and how important do they think it is in their discipline? With the push for cost-effectiveness, it is not surprising that the majority of respondents identify the financial aspect of using OER as the primary reason for their use. Interestingly, faculty that use OER find that the content can be easily updated or revised, although some faculty use OER for the quality of the content (Fig. 11). Contrasting these responses, graduate students and postdocs use the OER for content more than having the OER content being revised or updated. Some respondents do not use OER, which is an opportunity for libraries to enhance marketing and to raise awareness.

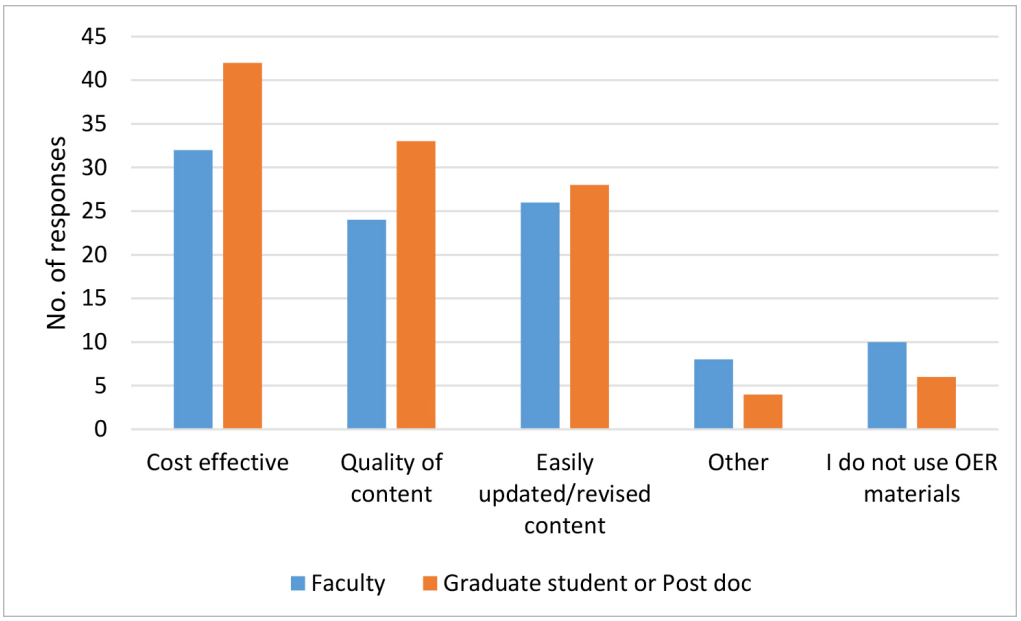

Fig.11. The reason why to use OER

It was evident from the survey that OER is an important resource for faculty and graduate students (Table 1). The use of OER is gaining importance in higher education with the availability of more resources (McKenzie 2017). The greatest challenge is how librarians can find a platform to initiate a conversation to work with campus stakeholders when identifying OER for the curricular and research needs at the institutional level, and for library liaisons to work with academic departments they support to raise awareness about OER in any medium for a specific discipline or field of study. This final question is somewhat troubling internally for libraries but can be seen as an opportunity to create new marketing and branding initiatives that promote OER.

Table 1: How important are OER in academia as a whole or in a specific field of study?

	Number of faculty	Number of graduate students/post-docs
Extremely important	6	14
Very important	20	20
Moderately important	13	9
Slightly important	13	6
Not at all important	6	3

Table 2. Which library resources do you use to find OER (select all that apply)?

	Faculty	Researcher/Scientist/ Extension agent	Graduate student/ Postdoc
Library catalog	12	2	19
OER web resources	12	1	16
Other	10	1	5
Didn't know the library has OER in the catalog	35	2	19

The overwhelming majority of respondents didn't know that the library has OER materials accessible through the library catalog (Table 2). How do the UF Libraries solve this issue? There are many options, such as arranging discipline-specific OER workshops, creating OER collections, or using faceted search options. The library catalog cannot compete with Google Scholar, so the onus falls on the libraries to develop an easy-to-use tool and a searchable catalog, which is easier said than done.

Challenges in Promoting OER

Faculty Perspective

Introducing the use of OER into the curriculum is not without challenges. The positive aspects include free/reduced educational resources in multiple formats, but there are many underlying faculty concerns about OER. Aside from the lack of familiarity, most OERs are geared toward lower undergraduate levels in subjects such as physics, chemistry, and biology, so there may not be acceptable materials at the upper level, graduate, or niche disciplines. Another consideration is that in some institutions, any changes to the core curriculum need to be vetted by curriculum and faculty committees, which could take up to a year or more if approved, not including the time required to redesign entire sections of classes. Faculty also may be hesitant to adopt OER due to lack of time to properly evaluate the materials' scope, coverage, and accuracy. Additionally, if faculty are using a textbook that they wrote, there could be some financial considerations (i.e., royalties).

Library Perspective

It may be challenging to assess OER in the library collection from a library perspective, and given that some disciplines offer more OER, there could be an imbalance in core collections. Another challenge is discoverability in the library catalog. The MARC records may not offer call numbers or subject headings for broad categories. The big question is if the OER should be a separate collection that is easily identifiable or be blended in with the entire collection? From a usability standpoint, the features and functionality of using an

OER must be taken into consideration. If the material is not easily accessible, then the user will be reluctant to use the material. Assessment of OER and usage statistics may also prove challenging. Libraries must develop a consistent policy statement on how OERs are marketed and supported at their institution and within the library. They must seek out the partner with departments or faculty who are currently using OERs or support their use assess performance/usage measures through case studies.

Implications and Strategies

Libraries should support the higher education initiative to reduce the price of textbooks and research materials. To accomplish this, libraries should make OER available for courses and research, where applicable, and promote the use of OER as supplemental resources for curriculum support. Libraries should strive to list OER, in any format, in the library catalog or collections that can be easily searched. When libraries support the OER initiative, there may be a benefit to collaborate more closely with faculty to discover the value of OERs in higher learning. In one case, we worked with a professor who wanted to include only open textbooks and reading material for her new course.

Here are a few considerations:

- Does the campus community (librarians, students, faculty, and researchers) know about OER? If not, develop a marketing and branding campaign.
- Do faculty and students know how to access OER through your library catalog? How are these materials cataloged? Are they easily accessible and easily searchable?
- What are the institutional goals (current or in the process of) to promote awareness of OER? Does the library include OER in their collection management, technical services, or public services goals and objectives? Are these goals/objectives supportive of the institutional goals? How can the library play a role in curriculum and research support at the institutional level?
- If librarians are involved in OA/OER collections, which collection areas are of the most significant interest? How can collection policies be developed based on a *just-in-time* approach?

Conclusion

This survey attempted to better understand how the UF STEM faculty and graduate students/postdocs perceive their knowledge and use of OER in the classroom and research activities. Based on the results, the respondents recognized the importance of OER. They used these materials in research/scholarly activities and instruction, but not as a primary or only source of knowledge. There is still a big part of the faculty and student community unaware of OER content and access. The majority of respondents do not know that the libraries offer OER collec-

tions through the UF library catalog. This is an excellent opportunity for the library to educate users on the availability of OER. This information will challenge the library community to think about how to best brand, market, and provide sustainable collections of OERs to support their institution's mission.

Acknowledgment

The authors would like to thank all survey respondents for their time.

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Appendix I

Original Survey Instrument

A Study of STEM Usage and Perceptions of OER at a Large Research University

Open Educational Resources: Survey

Q1 Thank you for choosing to participate in our UF Libraries Science Collections - patrons perspectives survey. We wish to understand user experience in using open educational resources (OER) for teaching or research. The Hewlett Foundation defines OER 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. OER include full courses, course materials, modules, textbooks, streaming videos, tests, software, and any other tools, materials, or techniques used to support access to knowledge." (http://www.hewlett.org/programs/education-program/open-educational-resources).

We appreciate your feedback. The survey is anonymous and will take less than 5 minutes. The results of the survey are important as the libraries strive to build better collections to support research and curriculum activities. Please click the ">>" button below to continue.

Q2 Select your primary status at UF (select one option)

- ❍ Faculty
- ❍ Researcher/Scientist/Extension
- ❍ Graduate Student OR Post Doc
- ❍ Visiting Scholar

Q3 Please identify your primary department at UF

Q4 Please rate your level of awareness of OER materials:

Q5 Have you ever used OER materials for instruction or research? Y N IDK

If No Is Selected, Then Skip To End of Survey Q9

Q6 If yes, please select which type of OER materials you use (take from definition list)

Q7 Why do you use OER materials?

Cost effectiveness

Quality of content

Easily updated/revised content

Other

Q8 Which library resources do you use to find OER materials? (select all that apply)

- ❑ Library catalog
- ❑ OER web resources
- ❑ Other _____
- ❑ Didn't know the library has OER materials in the catalog

Q9 How do you incorporate OER in your research/scholarly activities? (select all that apply)

- ❑ Grant activities
- ❑ Publishing in journals or books
- ❑ Publishing directly on the web
- ❑ Dissertation/thesis writing
- ❑ Other _____
- ❑ None

Q10 How do you incorporate OER into instruction? (select all that apply)

- ❑ Course textbook
- ❑ Course reserves
- ❑ Class assignments
- ❑ Supplemental readings

- ❑ Other _____
- ❑ None

Q11 What are the barriers for using OER in your curriculum? (select all that apply)

Lack of time to review OER materials

Lack of time to redesign syllabus to include OER materials

Unfamiliarity with the OER subject material

Would need departmental approval (curriculum committee, dept chair, college level)

Other

None

Q12 How important are Open Educational Resources in your work or field of study.

- ❍ Extremely important
- ❍ Very important
- ❍ Moderately important
- ❍ Slightly important
- ❍ Not at all important
- ❍ Don't know

Q13 Thank you for taking the time to complete this survey. For more information on Open Educational Resources, you may provide your email so a librarian can follow up, or please copy this link into a separate browser:

http://guides.uflib.ufl.edu/c.php?g=147544&p=968355

The Impact of Free and Open Educational Resource Adoption on Community College Student Achievement and Course Withdrawal Rates

Megan Dempsey
Raritan Valley Community College

Abstract

This study examines the impact of free and open educational resource (OER) adoption on end-of-semester grades and withdrawal rates of community college students. Performance data for 1,209 students in seven courses were analyzed to determine if there was a significant impact of OER on student performance and persistence for all students and for Pell grant recipients, part-time, first-time and non-white students. Results found no significant difference on end-of-semester grades between students in OER courses and those in courses using a traditional textbook. In addition, no significant difference was found based on Pell grant status, part-time status, or full-time status. However, significant differences in withdrawal rates and end-of-semester grades exist based on ethnicity. When Hispanic students persist in OER courses to the same extent as their white peers, they are more likely to achieve a higher grade than Hispanic peers in non-OER courses. Yet Hispanic students withdrew from OER courses at higher rates than all other ethnicities. Black/African American students persist in OER courses at a higher rate than Hispanic students but receive lower final grade averages in these courses. The current research and findings are a valuable contribution to the body of research on adopting free and open resources at the community college level and suggest future areas of study regarding OER and non-white populations.

Keywords: community colleges; student achievement; withdrawal rates; marginalized populations; OER efficacy; underserved students

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El impacto de la adopción de recursos educativos abiertos y gratuitos en el rendimiento de los estudiantes de las universidades comunitarias

Resumen

Este estudio examina el impacto de la adopción de recursos educativos abiertos y gratuitos (FOER) en las calificaciones de fin de semestre y las tasas de abandono de los estudiantes de colegios comunitarios. Se analizaron los datos de desempeño de 1.209 estudiantes en siete cursos para determinar si hubo un impacto significativo de FOER en el desempeño y la persistencia de los estudiantes para todos los estudiantes y para los beneficiarios Pell, estudiantes a tiempo parcial, estudiantes por primera vez y no blancos. Los resultados no encontraron diferencias significativas en las calificaciones de fin de semestre entre los estudiantes de los cursos FOER y los de los cursos que utilizan un libro de texto tradicional. Además, no se encontraron diferencias significativas en función del estado Pell, el estado a tiempo parcial o el estado a tiempo completo. Sin embargo, existen diferencias significativas en las tasas de retiro y las calificaciones de fin de semestre según el origen étnico. Cuando los estudiantes hispanos persisten en los cursos FOER en la misma medida que sus compañeros blancos, es más probable que obtengan una calificación más alta que sus compañeros hispanos en cursos que no son FOER. Sin embargo, los estudiantes hispanos se retiraron de los cursos FOER en mayor proporción que todas las demás etnias. Los estudiantes negros / afroamericanos persisten en los cursos FOER a un ritmo más alto que los estudiantes hispanos, pero reciben promedios de calificaciones finales más bajos en estos cursos. La investigación y los hallazgos actuales son una contribución valiosa al cuerpo de investigación sobre la adopción de recursos abiertos y gratuitos a nivel de colegios comunitarios y sugieren áreas de estudio futuras con respecto a los REA y las poblaciones no blancas.

Palabras clave: colegios comunitarios; logro estudiantil; tasas de retiro; poblaciones marginadas; eficacia REA; estudiantes desatendidos

采纳免费的开放教育资源对社区大学学生成绩产生的影响

摘要

本研究分析了采纳免费的开放教育资源（FOER）对社区大学学生的期末成绩以及弃课率产生的影响。分析了7门课程中1209名学生的成绩数据，以确定FOER是否对以下学生的成绩和弃课率产生了显著影响：所有学生、佩尔助学金获得者、兼职学生、首次上大学的学生、以及非白人学生。分析结果发现，参加FOER课程的学生的期末成绩与使用传统课本的学生相比不存在显著差异。此外，是否获得佩尔助学金、兼职或全日制情况都未产生显著差异。不过，族群性会导致弃课率和期末成绩之间出现显著差异。当西班牙裔学生和其白人同学以同等程度参与FOER课程时，他们比参加非FOER课程的西班牙裔学生更有可能取得更高的成绩。不过，比起其他族群，西班牙裔学生在FOER课程上的弃课率更高。黑人/非裔美国人学生比西班牙裔学生更能坚持FOER课程学习，但取得的最终成绩低于后者。本研究及其研究发现对关于社区大学采纳免费开放资源的研究作出了宝贵贡献，并对有关OER和非白人群体的未来研究领域提出建议。

关键词：社区大学，学生成绩，弃课率，边缘化群体，OER效能，教育资源不足的学生

Introduction

Since May 2018, Raritan Valley Community College (RVCC) faculty have been offered mini-grants to adopt free and open educational resources (OER) in lieu of traditional, commercial textbooks to convert their course sections to "z-courses" (zero-textbook costs). Rather than strictly requiring the adoption of open educational resources, these grants allow faculty to also choose digital copyrighted materials that are free for students and can be legally used under Fair Use guidelines. Thus, a wide variety of free course materials could be adopted by faculty with the goal of eliminating commercial textbook costs for students. The first semester of grant-funded z-course conversions was Fall 2018, with seven courses converting to z-courses for at least one section. Five additional grant-funded courses implemented free and/or open resources in Spring 2019, and the grant program has continued since then. Faculty who convert to z-courses consistently report that their students were both surprised and relieved to find out that there was

no required textbook purchase for the course. Anecdotal evidence and results from a voluntary survey sent to students in these courses show that students are generally satisfied with the OER materials, prefer using OER over purchasing a textbook, and are likely to enroll in z-courses in future semesters.

As RVCC's initiative was growing, Colvard, Watson and Park (2018) published a large-scale study conducted at the University of Georgia that demonstrated a significant impact on student achievement in courses using OER. Their results indicated that end-of-course grades increased and DFW (Drop, Fail, Withdraw) rates decreased for all students across the courses they studied. More importantly, after disaggregating the data, they found that DFW rates "decreased dramatically for student populations [that they] hypothesized would benefit the most from free textbooks (e.g., Pell eligible students, underserved populations, and part-time students" (p. 272). The authors rightfully did not generalize their findings across all institution-types and recommended that other institutions perform similar research on the achievement of traditionally underserved students in OER courses.

RVCC, a mid-sized community college in central New Jersey, serves a population that could realize significant benefit from the use of OER in lieu of costly textbooks. In Fall 2018, 60.8% of RVCC students were part-time, 30% received a PELL grant, and 34% reported Hispanic, black, or African American ethnicity. The current study seeks to expand on Colvard, Watson and Park's (2018) research by applying a similar methodology in a community college setting. In addition, while the courses in the previous study all used a specific OER – OpenStax textbooks – this study will demonstrate whether the findings are applicable to students taking courses using a variety of OER.

The following research questions guided the study:

1. Is there a significant difference in student achievement for students in OER sections compared to sections of the same course taught by the same instructor in a previous semester using a commercial textbook?

2. Is there a significant difference in student achievement for Pell recipients, non-white students, first-time students, or part-time students in OER sections compared to previous semester sections taught by the same instructor using a commercial textbook?

Literature Review

Much of the OER research conducted at community colleges has focused on adoption of an open textbook in a specific course or discipline and on the perception of OER by students and/or faculty. Hilton, Gaudet, Clark, Robinson and Wiley (2013) found that student and faculty perceptions of OER used in five courses in the Scottsdale Community College math department were gener-

ally positive and that there were no significant negative or positive changes in educational outcomes. Several studies using surveys of students and faculty at community colleges found that respondents had positive experiences using open textbooks, appreciated the low/no cost of course materials compared to traditional textbooks, and perceived the quality of open textbooks to be the same as, or better than, commercial textbooks (Bliss, Hilton, Wiley & Thanos, 2013; Bliss, Robinson, Hilton & Wiley, 2013; Illowsky, Hilton, Whiting & Ackerman, 2016; Read, Tang, Dhamija & Bodily, 2020).

Moving beyond the perception of OER, researchers have examined OER's impact on grades, persistence, and retention. Allen, et al. (2016) compared exam grades of students taking an undergraduate chemistry course using either a traditional textbook or the ChemWiki OER and found no substantial difference in student performance between the two. Shaw, Irwin and Blanton (2019) analyzed DFWI (Drop, Fail, Withdrawal, Incomplete) rates in undergraduate business courses at an online university. Their data revealed that OER adoptions had a significant impact on both decreasing and increasing DFWI rates. However, no statistical significance was found when comparing DFWI rates across all courses, so they "conclude conversions to OER did not impact the course DFWI rates in online courses in undergraduate online education for the School of Business" (p. 13).

Fischer, Hilton, Robinson and Wiley (2015) conducted a study using student data from courses at four different institutions to measure course completion, final grades and enrollment intensity. While there were no significant differences found regarding achievement measures, they did find that students who took an OER course enrolled in a higher number of credits the next semester. Hilton, Fischer, Wiley and William (2016) examined the course throughput rates in 67 non-z courses (traditional textbook) and z-courses (OER) at Tidewater Community College. They found that students in z-courses were less likely to withdraw and more likely to receive the grade of C or higher than their peers in non-z courses. However, the drastic difference in the numbers of students enrolled in non-z versus z-courses is acknowledged by the authors as a study limitation because significantly fewer students were enrolled in the z-courses.

The previously mentioned study by Colvard, Watson and Park (2018) is a large-scale study across multiple disciplines to analyze the effect of OER on student grades and to disaggregate data by demographic factors for closer analysis. Their study of 21,822 students determined that the use of OpenStax textbooks in eight courses improved end of course grades and decreased DFWI rates for all students and did so at higher rates for specific populations of (potentially at-risk) students.

As the body of OER research has grown, literature reviews and meta-analyses have been published to synthesize the findings of similar studies. Hilton (2016) reviewed 16 published studies on OER: nine that analyzed student learning outcomes in courses

that adopted OER and seven that examined student and/or faculty perceptions of OER. In general, and as described above in specific studies, Hilton found that students and faculty members find OER comparable to their traditional, commercial textbooks and the use of OER does not appear to negatively affect student performance. Clinton (2018) synthesized the results of multiple studies of OER use in psychology and came to similar conclusions. Those studies also show a decrease in withdrawals from psychology courses, but it is unclear whether OER play a role in that decrease. Clinton and Khan (2019) performed a meta-analysis of the results of several studies comparing academic performance and withdrawal rates in courses using OER and traditional textbooks. Based on the findings of 22 independent studies, they likewise conclude that "there were no meaningful differences in learning efficacy between students using open textbooks and students using commercial textbooks" (p. 13) and students in OER courses appear to withdraw less frequently.

It should be noted that Grimaldi, Mallick, Waters and Baraniuk (2019) have published a strong criticism of the methodology and assumptions of OER efficacy research. By conducting a simulation analysis to test the "access hypothesis" - the assumption that because OER increase students' access to textbooks, students may potentially perform better - they determined that "[e]ven under ideal conditions, detecting positive effects of OER should be extremely difficult" (p. 9/14). They assert that it is virtually impossible to detect any effect of OER use on performance, and thus, studies like Colvard, Watson and Park (2018), Fischer, Hilton, Robinson and Wiley (2015), Clinton and Khan (2019), and the current study do not provide insight on if and how OER affect student learning. Still, the author of this paper believes that the current research and findings, including a contradictory finding on withdrawal rates that leads to more questions than answers, are a valuable contribution to the continually growing body of research on adopting free and open educational resources, especially at the community college level, for which, as previously described, the research has focused extensively on perceptions of cost and quality.

Methods

Seven RVCC courses that adopted free and open educational resources in either Spring 2018 or Fall 2019 were identified for inclusion in this study. The courses chosen were taught by the same faculty member in a previous semester using a commercial textbook and in one of the identified semesters using OER. For example, a course that used OER in Spring 2018 was selected only if the same faculty member taught the course in Spring 2017 using a commercial textbook. This selection process provides a control measure over the influence of faculty member and semester on the results. Approval for this study was granted by the RVCC Institutional Review Board.

The number of sections in each course used in the study varies for several reasons: some faculty members

taught multiple sections of the same course in both semesters; some courses were taught by multiple faculty members in both the non-OER and OER semesters; some courses are only offered once each semester and taught by a single faculty member. The courses and number of sections selected are listed in Table 1.

Table 1. Courses and the number of sections selected in each semester

Course	Semester commercial	No. of sections	Semester OER	No. of sections
BUSI-111 Introduction to Business	Fall 2017	10	Fall 2018	10
BIOL-124 Anatomy & Physiology I	Spring 2018	7	Spring 2019	4
COMM-101 Speech	Spring 2018	3	Spring 2019	3
ENGL-112 English Composition II	Spring 2018	2	Spring 2019	2
FITN-132 Cardiovascular Conditioning	Spring 2018	1	Spring 2019	1
HLTH-109 Pharmacology	Spring 2018	2	Spring 2019	1
PHYS-130 Astronomy	Spring 2018	2	Spring 2019	2

For all students in each section, Institutional Research provided the following de-identified data:

- final grade
- term GPA
- full-time/part-time status
- first-time student status
- gender
- ethnicity
- Pell eligibility

Data were received for a total of 1,212 students. Three students' final grades were listed as AU indicating they were Audit status. These three students were removed from the study for a total of 1,209 student grades for analysis. The breakdown of students by course is shown in Table 2.

W (withdrawal) grades were separated from A through F grades for analysis. The remaining 1,111 A through F grades were converted to the numeric scale used for GPA calculation at the institution:

A = 4.0

B+ = 3.5

B = 3.0

C+ = 2.5

C = 2.0

D = 1.0

F = 0

A two-sample *t*-test of means was performed for all A through F grades to determine if there was a significant difference in final course grades. Then, two- and three-way ANOVAs were used to determine if various demographic factors, when combined with

enrollment in OER courses, impacted student performance. With grade as the dependent variable, ANOVAs were performed with the following groups of fixed factors:

- OER status and first-time student status
- OER status and full-time/part-time status
- OER status and ethnicity
- OER status and gender
- OER status and Pell eligibility
- OER status, Pell eligibility and ethnicity

Finally, a *z*-test of proportions was used to determine if there was a statistically significant difference in the percentage of W grades between OER courses and non-OER courses.

Table 2. Course and number of students in both OER and non-OER sections

Course	Students in non-OER Sections	Students in OER Sections
BUSI-111 Introduction to Business	291	326
BIOL-124 Anatomy & Physiology I	95	71
COMM-101 Speech	75	47
ENGL-112 English Composition II	41	105
FITN-132 Cardiovascular Conditioning	10	8
HLTH-109 Pharmacology	30	21
PHYS-130 Astronomy	43	46
TOTAL	585	624

Results

Final grades across courses

There was no statistically significant difference in final grades between students in OER courses (M=2.756) and non-OER courses (M=2.821) (t = -0.818, p < .05). The finding of no difference in final course grades suggests that students perform as well in OER courses as they do in courses using a traditional, commercial textbook. While there is no significant improvement (or decline) in student achievement, there is the likely benefit that students have saved money by not having to purchase or rent a commercial textbook for the class.

Demographic factors

No significant difference in student performance between OER and non-OER courses was found based on a student's first-time, full-time, or part-time status, gender, or Pell eligibility. Although

these results fail to support the findings of Colvard, Watson and Park (2018), they suggest that student performance across these demographics is essentially unchanged when a faculty member switches to using free and open educational resources.

There was, however, a statistically significant difference in student performance based on the interaction of OER status and ethnicity, $F(1,111) = 2.546$, $p = .038$. This difference is attributable more to ethnicity than to OER status, particularly the differences in mean grades across all sections between white and black/African American students, between white and Hispanic students, and between Hispanic and black/African American students. Regardless of OER status, the average final grade for white students ($M = 2.939$) is .84 greater than for black/African American students ($M = 2.099$), the largest difference in the study ($p = .014$) and indicative of the known gap in grade-based academic performance between these two groups. The average final grade for black/African American students decreased in OER courses, from 2.35 in non-OER courses to 1.85 in OER courses. The average final grade for Hispanic students increased from 2.381 in non-OER courses to 2.845 in OER courses, but white students overall still received average final grades that were .319 higher than those of all Hispanic students ($M = 2.613$, $p = .014$). The average final grade for white students also increased slightly from 2.917 in non-OER courses to 2.960 in OER courses (see Figure 1 below).

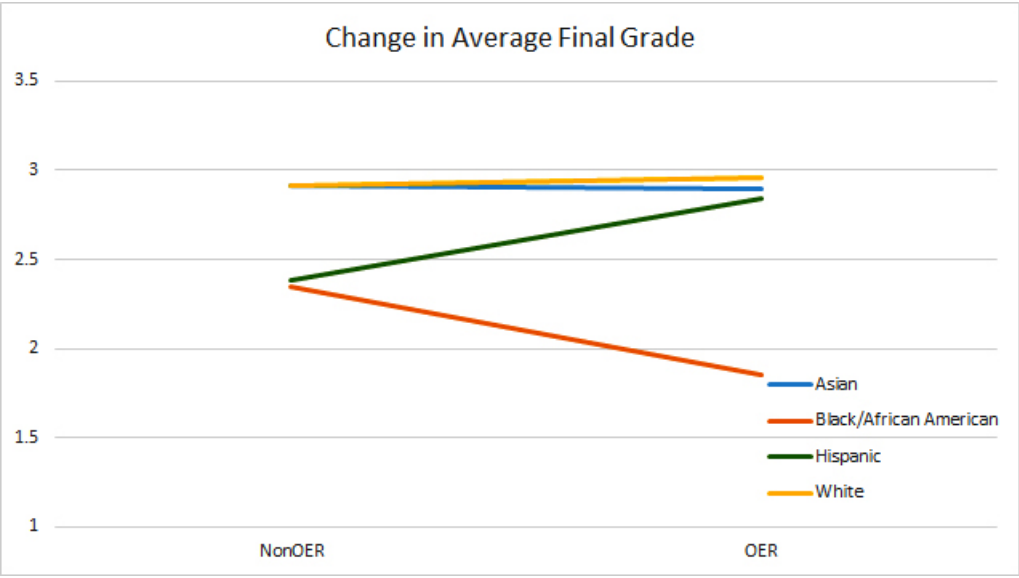

Figure 1. Change in average final grade between Non-OER and OER as a function of ethnicity

Withdrawal rates

During data analysis, it was noticed that there were a greater number of W grades for OER courses (n = 57, 10% of total grades) than for non-OER courses (n = 41, 7.5% of total grades). This was an unexpected observation if it is inferred that lack of access to course materials may trigger withdrawing from the course. A z-test of proportions revealed that OER courses had a statistically significant higher percentage of W grades than non-OER courses (z = 1.864, p = .03).

This data were also analyzed by ethnicity. Of 658 white students in the study, 7% (n = 46) received a W grade. Of 97 black/African American students, 11% (n = 11) received W grades, as did 11% of the 253 Hispanic students in the study (n = 28). The difference in proportion of black/African American students receiving W grades compared to white students did not exceed a 95% confidence level (z = 1.615, p = .053). However, the difference in proportion of Hispanic students receiving W grades compared to white students was significant (z = 2.358, p = .009) (refer to Table 3).

Table 3. Withdrawal rates by ethnicity across all courses

	A-F	W	Total	% Withdrawals
Asian	73	7	80	9%
Black/African American	86	11	97	11%
Hispanic	225	28	253	11%
White	612	46	658	7%
Total	996	92	1088	8%

Discussion

This study aimed to answer two research questions:

1. Is there a significant difference in student achievement for students in OER sections compared to sections of the same course taught by the same instructor in a previous semester using a commercial textbook?
2. Is there a significant difference in student achievement for Pell recipients, non-white students, first-time students or part-time students in OER sections compared to previous semester sections taught by the same instructor using a commercial textbook?

Consistent with the majority of OER research on academic performance, the results of this study found

no significant difference in student achievement for students in OER courses compared to courses taught by the same instructor in a previous semester using traditional textbooks.

Regarding the second question, no significant difference in student academic achievement was found for Pell recipients, first-time students or part-time students. These findings contradict those of Colvard, Watson and Park (2018) when applying a similar methodology to analysis of community college students. There are a number of differences between Colvard, Watson and Park (2018) and the current study, including the number of student grades analyzed, the type of course materials chosen to replace the commercial textbook, and the control of semester and instructor in the current study. Only 1,209 grades were used for this study, compared to over 21,000 in the previous. The number of students in each of the demographic categories in this study's sample is thus much smaller (305 Pell eligible; 317 first-time students; 381 part-time students). It is reasonable to conclude that the results of the larger study are more reliable but worth commenting on the other differences in these two studies. All courses analyzed by Colvard, Watson and Park (2018) used an OpenStax textbook. At RVCC, some courses used existing, published open textbooks (Anatomy & Physiology, for example) while others curated free and/or open digital materials in lieu of a commercial textbook (Cardiovascular Conditioning, for example). Potentially, the consistency of OER selection in the previous study, a one-to-one replacement of a traditional textbook with an OpenStax textbook, impacted students' learning experiences differently. Is it possible that students in underserved populations perform better with traditionally formatted textbooks like those published by OpenStax rather than curated materials that need to be accessed through the LMS and are organized in a structure determined by the individual faculty member? Student use of textbooks compared to curated materials is a potential area for future research.

There was an unanticipated finding on withdrawal rates in this study: students in OER courses withdrew at significantly higher rates than students in non-OER courses. This finding refutes the access hypothesis—that "day 1 access" to course materials has a positive impact on student performance (Hilton, 2016; Grimaldi, Mallick, Waters and Baraniuk, 2019). It also contradicts the findings of four prior studies conducted at community colleges that analyze differences in withdrawal rates (Hilton & Laman, 2012; Hilton, Gaudet, Clark, Robinson & Wiley, 2013; Hilton, Fischer, Wiley & William, 2016; Grewe & Davis, 2017)[1]. These studies either did not report student demographic data or did not disaggregate the data by demographics for analysis, so it is unclear whether there would have been significant findings based on ethnicity

1 Grewe and Davis (2017) combined W grades with F grades for analysis, potentially skewing a direct comparison.

or other factors. In addition, neither the current study nor any previous one has been able to draw causality between textbook choice and withdrawal rates, only correlation. Further qualitative research is needed to determine the relationship between students' motivation for withdrawing from classes and the use of OER.

Recommendations

This study's findings on overall grades and withdrawal rates with regard to students identifying as Hispanic or black/African American have the potential to inform strategic initiatives focused on closing the achievement gap (also called the opportunity gap). At RVCC, when Hispanic students persist in OER courses to the same extent as their white peers, they are more likely to achieve a higher grade than Hispanic peers in non-OER courses. This would suggest that increased offerings of OER courses would benefit our Hispanic population, an important finding considering RVCC's recent qualification as a Hispanic-serving institution. Yet there are unidentified factors that cause Hispanic students to withdraw from all courses at a higher rate than both white and black/African American students. Research is needed on why our Hispanic students are withdrawing at such high rates compared to non-Hispanic peers and what effect, if any, course material selection has on this decision. It may be worth determining how many of these students are also first-generation college students who have been found to be more likely to engage in negative academic behaviors, including dropping/withdrawing from classes (Nusbaum, Cuttler & Swindell, 2020).

On the other hand, although black/African American students are persisting in the courses studied overall at a higher rate than Hispanic students, they withdraw more frequently than white students *and* they receive lower final grade averages in OER courses. The reasons for this drop in average final grade in OER need to be explored, perhaps by examining if and how black/African American students use and engage with course materials in OER courses. For example, is the digital-first nature of OER course materials a barrier for this population, perhaps evidence of the digital divide?

Conclusion

Based on research that has consistently found no significant difference in academic performance between non-OER and OER courses, OER advocates have supported continued adoptions of OER because students are saving significant amounts of money and their performance is not being affected. Despite Grimaldi, Mallick, Waters and Baraniuk's (2019) assertion that it is virtually impossible to detect OER's effect on performance, this author would still argue that adopting free and open educational resources is a positive move for community colleges that want to demonstrate a commitment to student success and well-being. With access at the heart of the community college mission, OER

offerings demonstrate to students that the institution is aware of the countless barriers to obtaining a degree and is working to ensure that cost or access to course materials is not one of them. Nusbaum, Cuttler and Swindell (2020) found that first generation and ethnic minority students reported engaging in more negative behaviors, such as taking fewer classes, dropping/withdrawing from classes, and earning poor grades as a result of textbook cost compared to their ethnic majority and continuing-generation peers. Having conducted their study at a large, public university, Nusbaum, Cuttler and Swindell (2019) conclude that "[m]arginalized students are making a variety of decisions about their academic life based on textbook costs, including which courses to take and whether to drop particular courses" (p. 7). This is likely to be profoundly true of marginalized students who choose to enroll at lower cost, open admissions community colleges. Despite the uncertainty of whether student achievement is or is not directly impacted by OER adoptions, the goodwill effect of OER course offerings on students' perception of an institution's concern for their success and well-being should not be underestimated.

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Taking OER to the LIS: Designing and Developing an Open Education Course for Library Science Students

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Abstract

One often overlooked member of the open education community is the aspiring librarian. Students currently pursuing their Master in Library Science (MLS) degree are potential future leaders for a sustainable open education movement. The lack of formal course options in existing library science education programs, for learning about open education, is a potential barrier to an open movement that is inclusive of library science graduate students. This article describes the design, development, and implementation of what is believed to be the first formal, dedicated course in open education librarianship offered by an American Library Association accredited library and information science (LIS) program. The nature of the course content, learning outcomes, assignments and student reactions to and reflections of the course are discussed, along with the potential implications for both LIS programs and the open education community. Expanding the number of LIS programs that offer formal open education courses has the potential to contribute to the sustainability of the open education movement through the preparation of a future generation of advocates and leaders.

Keywords: library education; open education; open education librarianship

Llevando REA al LIS: diseño y desarrollo de un curso de educación abierta para estudiantes de bibliotecología

Resumen

Un miembro de la comunidad de educación abierta que a menudo se pasa por alto es el aspirante a bibliotecario. Los estudiantes que actualmente cursan su Maestría en Bibliotecología (MLS) son futuros líderes potenciales para un movimiento de educación abierta sostenible. La falta de opciones de cursos formales en los programas

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existentes de educación en bibliotecología, para aprender sobre la educación abierta, es una barrera potencial para un movimiento abierto que incluya a los estudiantes graduados en bibliotecología. Este artículo describe el diseño, desarrollo e implementación de lo que se cree que es el primer curso formal dedicado en bibliotecología de educación abierta ofrecido por un programa de bibliotecas y ciencias de la información (LIS) acreditado por la American Library Association. Se discuten la naturaleza del contenido del curso, los resultados del aprendizaje, las tareas y las reacciones de los estudiantes y las reflexiones del curso, junto con las posibles implicaciones tanto para los programas de LIS como para la comunidad de educación abierta. Ampliar el número de programas de LIS que ofrecen cursos formales de educación abierta tiene el potencial de contribuir a la sostenibilidad del movimiento de educación abierta a través de la preparación de una futura generación de defensores y líderes.

Palabras clave: educación bibliotecaria; educación abierta; bibliotecología de educación abierta

将开放教育资源带入图书馆与信息科学：为图书馆学专业学生设计和开发开放教育课程

摘要

开放教育界中一个经常被忽视的群体是渴望成为图书馆员的那部分人。目前攻读图书馆学硕士（MLS）学位的学生是可持续开放教育运动的潜在未来领导者。当前图书馆学专业中缺乏关于学习开放教育的正式课程选项，这为包容图书馆学研究生的开放运动造成了潜在障碍。本文描述了由美国图书馆协会授权的图书馆与信息科学（LIS）专业所提供的首次正式开放教育图书馆学课程的设计、开发和执行。探讨了课程内容的性质、学习成果、作业、以及学生对课程的反馈和反思，并探讨了对LIS专业及开放教育界的潜在意义。对提供正式开放教育课程的LIS专业的数量加以扩大，此举可能有助于通过培养未来一代的倡导者和领导者，进而对开放教育运动的可持续发展作贡献。

关键词：图书馆教育，开放教育，开放教育图书馆学

Introduction

To achieve sustainability, the open education movement needs to develop its pipeline of future leaders. That need to educate future leaders was recognized early on in the OER movement and that (Jensen & West 2015) effort is already in progress. Both SPARC and the Open Education Network offer formal educational and leadership academies for aspiring open education leaders. SPARC's Open Education Leadership Program began in 2017 and enrolls cohorts of approximately 20 individuals, mostly academic librarians. Each participant conducts a capstone project and several past projects provide educational and advocacy resources that benefit the global open education community. The Open Education Network focuses more on best practices for creating and sustaining open education projects than formal leadership, but its Certificate in OER Librarianship describes itself as "creating open education program leaders." Together, these programs and related educational workshops and institutes offered at state and regional levels by library consortia and state agencies, do contribute to the preparation of the open movement's future leaders.

Many of these programs' participants are academic librarians who are already committed to the basic tenets of open education. They may be their institution's leading proponent of open education or a recognized state advocate. Existing open education programs such as those described above work to sharpen the saw, so to speak, by giving the participants enhanced abilities to promote the advance of the open movement locally, and even globally. In doing so they fulfill the early vision for OER growth shared by Allen, Bell and Billings (Allen, Bell & Billings 2014; Allen, Bell & Billings 2016). But how is the open movement being introduced to new, potentially interested future enthusiasts? Practicing academic librarians have opportunities to learn about open education and develop the requisite skill set from colleagues, webinars, conference presentations and the journal literature. This article proposes that there is another audience of potential future open advocates and leaders who could be reached at a much earlier stage in their library careers – the library science student.

Students currently enrolled in one of the 62 North American, American Library Association accredited library schools have few opportunities to gain an introduction to the open movement or the specifics of open education resources or open pedagogy. While the topic might be introduced in an existing course about scholarly communications or open access, open education may be limited to a single class or the instructor may focus only on open educational resources, ignoring other critical aspects of the open movement. Where this might be the case, the presence of a course in scholarly communications in the library school curriculum is no certainty. It is more certain that few of these programs offers a dedicated course in open education as an elective or seminar. Recognizing the opportunity to create more future open education

leaders through an introductory library science open education course, the author leveraged their role as an adjunct instructor for the San Jose State University iSchool to propose, design, develop and deliver an open education course. This article will describe the rationale for the course, its learning objectives, the design of the curriculum, how students responded to their exposure to open education and finally, and what the open movement can take away from the lessons learned from the introduction of an open education course into a library school program.

Literature Review

Open Education in LIS Programs

There is a dearth of professional library literature about the presence of either scholarly communications or open education within library science programs. A search of the library literature uncovered no research or discussion of the incorporation of open education, or for that matter, scholarly communication, into the curriculum of library school programs. Accreditation standards for master's programs in library and information studies make only broad references to what the curriculum should cover, including such topics as "knowledge creation" and "communication" of information resources (American Library Association, 2015). Topics included under the broad umbrella of scholarly communications are too specific for mention, but the standards indicate that the curriculum "Provides direction for future development of a rapidly changing field". Open education, as it pertains to academic and school librarianship, would certainly fit into a curriculum designed for a "rapidly changing field" (American Library Association, 2015).

Purpose of the Study

Recognizing the absence of any known course within an LIS program dedicated to open education, the author sought to develop a course that would introduce aspiring librarians to the field of open education, focusing primarily on the crisis within the textbook publishing industry as it impacts college students, the potential of open educational resources to resolve that crisis and how the application of open pedagogy leverages open resources to enhance student learning. Having previously proposed, developed, and implemented a new course into the curriculum, the author was familiar with the proposal process at the iSchool where they taught as an adjunct instructor. After having ascertained that the program director was enthusiastic about offering a new seminar course on open education, the author developed the initial proposal for consideration by the iSchool curriculum committee.

Methods

Timeline and Curriculum

Intended initially as a four-week, one-credit course, the plan was to launch the open education course, formally proposed as "Open Education Librarianship", during the summer 2020 semester. The course proposal was sub-

mitted in January 2020 and approved 30 days later with minor revisions requested. With a draft syllabus and course roadmap in hand, the development of the course in the Canvas learning management system began in mid-February with the intent to have the asynchronous-delivered content ready by May 1, 2020. With a four-week course the significant challenge is deciding both what to include and exclude. To focus the process of choosing content for each week's material, as laid out in the draft syllabus, the course learning objectives served as guide:

- *Advocate* for open education values and strategies within an academic institution or other educational community.
- *Differentiate* OER from other learning content
- *Competently search* for and identify OER across academic disciplines
- *Clearly explain* open pedagogical methods and identify examples of open pedagogy assignments and projects that support faculty efforts to engage students in their own learning through the creation of sustainable learning content that is reused and further developed by future students.
- *Gain familiarity* with OER policy and legislation for advocacy development.
- *Identify* trends in open and commercial publication of learning material.

With clarity on what students should know and the competencies gained in this course, the weekly distribution of subject content evolved.

Week one introduces students to the textbook pricing crisis and its impact on college students. Along with the growth of open education resources and the textbook affordability movement, as a response and potential solution to the multitude of economic and learning challenges presented by high textbook costs, the first week covers basic open learning resources. Week two then pivots to two, core course topics, open pedagogy and advocating for open education. Students are exposed to examples of open pedagogy assignments and understand their value, as they gain insight into what it means to be an open advocate and the impact at national, regional, and state levels. Week three delves into practical aspects of the work of an open education librarian. Having learned the primary finding resources and major OER repositories, the students build skills to assist educators in identifying and locating OER, design workshops for open education and develop and implement an institutional OER initiative for educators. Week four is dedicated to covering current issues in open education.

The final week is designed for flexibility to ensure students exit the course aware of the issues of the day. In the first iteration of the course, those issues include inclusive access deals, diversity, equity and inclusion in open education, the Open Ed conference, and trends in OER research. Students

discover the best sources for keeping up with open education developments, along with future workshop and learning opportunities to support their continuing professional development. While this curriculum design worked well, student evaluations suggested that week two was perhaps too early in the course to prepare them for that week's advocacy-related assignment. The next iteration of the course is likely to shift the content so that advocacy is presented in week three.

Designing Assessments and Assignments

Using backward design (Wiggins, McTighe, Kiernan, & Frost, 1998) to develop a course, one begins by identifying the student learning objectives. The next step is to decide what manner of assessment will determine if students achieve those objectives. Finally, the instructor creates the assignments that enables the effective assessment of student performance in demonstrating competency in achieving the objectives. It also helps when the assignments are practical, connected to students existing experience and are challenging, educational, and fun. This was the most challenging part of designing the course as there are a multitude of options for assignments and with only four contributing to the final grade, making the choices felt high-stakes.

Assignments were a combination of graded discussion groups and weekly challenges. It's common in asynchronous online courses to begin with a discussion post in which everyone introduces themselves to their fellow students, but for the initial post, students were asked to share a memorable textbook story. It resulted in a bonding experience. Every student was able to recall an outrageously expensive textbook purchase or a textbook that was bought and never put to use. Students with college-age children expressed the frustration of how much the cost of textbooks added to their debt load. This discussion meshed well with the week's assignment. Students went to the website OER Mythbusting where they selected one myth for analysis. They were asked to write a short essay reflecting on their myth and how they would respond to that myth and bust it in conversation with someone, a faculty member for example, who believed that myth. As most of the students were relatively new to open education, this assignment exposed them to the common misunderstandings about OER.

For week two's advocacy topic, students needed to understand the important role that open education librarians play as advocates for affordable learning. The assignments would provide two opportunities to immerse themselves in this experience. For the discussion each student was assigned a nationally recognized open advocate to research and gather information about, and then share a profile of that advocate in their post. This worked well as each student contributed to a collaborative learning experience where all could become familiar with a large cohort of open advocates, their backgrounds and contributions to the movement. As this week's content covered a number of

legislative advocacy topics, at both the national and state levels, students were asked, for their primary assignment, to create a short video in which they would advocate for an issue of their choice. The premise was to role play making a case for an open education issue for an audience of faculty or librarians.

To deliver on giving the students a practical skill set they could apply right away, the primary assignment for week three focused on identifying and finding OER. Using a worksheet developed for SPARC's Open Education Leadership Program, the students conducted an OER Treasure Hunt. After identifying an existing course at a college of their choice, students first priced out the required commercial textbooks. They then attempted to find OER to replace it, sought out reviews, examined the OER themselves and then reflected on their experience. It demonstrated that depending on the course, level at which it is taught and need for supplementary learning resources, identifying appropriate OER can be quite the challenge. The weekly discussion gave students an opportunity to delve into the OER quality debate. Using course readings and their own research into the topic, students developed their personal approach to responding to questions about or direct attacks on the quality of OER.

Even a four-week course can have a capstone project of sorts. In week three, students learned about campus OER initiatives and developing educational workshops to create awareness about open education among faculty. For their fourth and final assignment, students could choose any course topic and create a five-minute multimedia presentation as a segment of a broader open education workshop. Students chose topics such as developing an open pedagogy assignment, explaining the difference between free and open learning resources and an overview of how Creative Commons Licensing works. These creative presentations demonstrated that students had a firm enough grasp of the course content to explain it to others in just a few minutes. To introduce students to the research literature on the efficacy of OER, each selected one related article and wrote a summary and analysis for the final week discussion post. That enabled each student to leave the course having gained exposure to sources of literature on the pedagogical advantages of OER.

Results

Student Reactions and Reflections

While the official iSchool evaluations would provide information and insights into the value students derived from the course, the formal evaluation would fail to collect some of the more unique feedback the author sought from students. Shortly after the course ended, students received a link to a set of the instructor's own questions. Seventeen out of 30 students responded. To start, the students were asked why they selected the course. In Table 1, it's clear most of the students were influenced by their current job experience and what they heard about open educational resources. Several students were taking the course for a post-Master's certificate.

Table 1. Why Did You Take this Course? (multiple selections allowed) [*N*=17]

Because I became interested in open issues in a scholarly communications course	23.5% (4)
Became interested in open education from my job	53% (9)
Heard about OER from listserv discussions	18% (3)
Needed a one-credit course to graduate	23.5% (4)
Other (passion for subject; heard about it in a webinar; saw jobs posted for OER librarians)	23.5% (4)

Several questions sought to obtain a sense of student satisfaction with the course. When asked how effective the course was, on a scale of 1 to 5 with 5 being "highly effective" and 1 being "not at all effective", 15 out 17 respondents chose "5". When asked "Would you recommend this course to another student, on a scale of 1 to 5 with 5 being "highly likely" and 1 being "not likely at all", 16 out of 17 respondents chose "5". The official course evaluation also supported student satisfaction with the course, as the average rating across all evaluation factors was 4.3 out of 5.

One measure of student satisfaction and perceived academic success is their own perception of the course's impact on changing their knowledge of the subject matter. Students were asked to self-identify their level of confidence with the course material both at the start of the course and at the end of the course. Tables 2 and 3 report the results of this question.

Table 2. Rate Your Level of Confidence Prior to the Course [*N*=17]

5= High Level of Confidence	6% (1)
4	12% (2)
3	6% (1)
2	35% (6)
1= Low Level of Confidence	41% (7)

With the majority of students reporting low confidence in their initial knowledge of open education, the course presented them with the opportunity to improve and build confidence as aspiring open education librarians. But did it? According to Table 3, the vast majority of the responding students, at the end of the course, rated their level of confidence as "high".

Of considerable significance is the shift from 41% of students indicating "low confidence" to absolutely no students reporting low confidence at the end of the course. Every student experienced some increase in their personal level of confidence. In addition to affirming the effectiveness of the course, these results reflect the students' own belief that they achieved the course learning outcomes.

Table 3. Rate Your Level of Confidence After the Course [*N*=17]

5= High Level of Confidence	41% (7)
4	47% (8)
3	6% (1)
2	6% (1)
1= Low Level of Confidence	0% (0)

That said, an instructor would prefer their course to do more than just achieve the stated learning outcomes. A desirable outcome is to influence students in a way that truly makes a difference in their career outlook. The survey asked students to indicate the potential impact of the course on their career outlook. In the course, students learned about the emerging specialty position, open education librarian. Table 4 provides results to a question asking students if they'd be likely to apply for such a position, and it appears that they would indeed. While it's impossible to know just how likely it is students would follow through on this, it suggests that after taking this course it is a more realistic option for them than at any time prior to the course.

Table 4. Would You Apply for an Open Education Librarian Job? [*N*=17]

5= High Likely	30% (5)
4	30% (5)
3	40% (7)
2	0% (1)
1= Not at all Likely	0% (0)

Admittedly, committing to a career choice after a four-week course is a bit of a leap of faith, but what about a smaller commitment to taking action after completing the course. How likely is it that students would want to continue learning about and engaging with professional development programs related to open education? In response to a question about their interest, the vast majority of students, as indicated in Table 5, expressed their desire to continue building on their potential as open education librarians.

Table 5. Would You Attend an Open Education Professional Development Program? [*N*=17]

5= High Likely	82% (14)
4	12% (2)
3	6% (1)
2	0% (0)
1= Not at all Likely	0% (0)

When asked what they would most take away from the course to incorporate into their current or future library practice, the students clearly indicated their ability to find concrete applications of the course content:

- Aside from now wanting to pursue OER librarianship as a career path, I can immediately begin to take the tools and skills acquired in the class as relevant situations arise.
- [I will] provide support for our OER librarian, and to our distance education faculty.
- I will start by speaking with faculty in my liaison areas to gauge their knowledge and understanding of OER.
- I plan to use what I've learned in this course to advocate for OER in my future position as an academic librarian.
- I would definitely apply by advising teachers, principals and students I work with.
- [I] would like to write a resolution to bring to the academic/classified senate at my workplace; share information with faculty about OER.

When asked for their final reflections on the course, students pointed to those aspects of the course that contributed to their professional growth and positive attitudes about their potential to advance open education:

- I really liked the practical nature of the assignments;
- Creating the two videos, the mythbusters assignment, and the scavenger hunt all increased my knowledge of OER and my confidence in presenting on it;
- I wish it was longer! The course covered so much information in such a short period of time;
- I loved learning about OER;
- It is an exciting topic that I am intending to continue to learn about and pursue professionally;
- I learned a lot and I'm so glad I took a class outside of my intended path;
- It's made me excited to enter the field and consider pursuing a career in academic librarianship;
- More on open pedagogy, maybe an assignment involving it.

The author asked the students one additional question. Based on their experience in the course, did they think that LIS students at all ALA-accredited programs should have access to course in open education librarianship. Given their enthusiasm for the course, as seen in their final course reflections, 100% of the students responded affirmatively to the suggestion that all LIS programs should offer a course in open education librarianship. To discover how many LIS programs, other than the author's own iSchool, currently offer an open education course or even a scholarly communications course with open education content, the author contacted the dean or program director at each

ALA-accredited LIS program in North America. They were asked to complete a survey with two questions about the availability of an open education course. All six respondents indicated that there was no such course in their curriculum or present in a scholarly communications course. While no concrete conclusion about the presence of open education courses in LIS programs may be made from the limited response, the overall lack of response could be taken as an indicator that many other programs simply have nothing to report. It certainly supports the author's anecdotal evidence that no other LIS program currently offers a dedicated course on open education.

Conclusions

Takeaways for the Open and LIS Program Communities

What conclusions may be drawn from the design, development and delivery of an open education course at a single LIS program? As an experiment in LIS curricular programming, the indications are that the course was well received by students, resonated with their interest in social justice issues and has the potential to become a regular offering within the iSchool's special seminar offerings. But what larger lessons might be learned from the inclusion of an open education course in the LIS curriculum? Potentially, the open movement community, as well as those who lead LIS programs, could benefit if similar courses were offered to more aspiring librarians.

There are two core takeaways that are of interest to both communities. First, as demonstrated by this course, students in LIS programs will, if given the opportunity, express interest in open education and the open education movement. Initially, that interest may be driven by their awareness of the cost of higher education and the burden of expensive textbooks. However, contemporary LIS students are also attracted to the social justice implications of creating equitable access to education that aligns with the broad goals of the open movement. The author thought the course might just make the minimum registration requirement of 15 students. When the course reached the maximum registration of 35 students within two weeks, it was both a surprise and affirmation of LIS students' interest in an open education course– even accounting for the few students who simply needed any one-credit course to graduate.

Second, if LIS programs are seeking new courses, those they can offer with a minimum of investment and risk and which have high potential for popularity with students, a course in open education is a strong candidate to fulfill the demand for new, cutting-edge additions to the curriculum. Students may see a course in open education as a worthwhile career opportunity. Within academic libraries, there are an increasing number of open educational resources (OER) librarians or open education librarians (Larson 2020). Students interested in these, or related scholarly communications librarian jobs, would be well positioned to com-

pete for them with an open education course on their transcript. LIS programs that choose to offer open education courses could promote these types of positions to prospective students as potential career opportunities for those with MLS degrees.

The open movement is fortunate to attract many high caliber librarians to their ranks. In part, owing to the presence of mentors, leadership programs, workshops and open education conferences, there is currently no dearth of librarians eager to commit to advancing and advocating on behalf of the open movement. Looking to the future of the open movement, the next generation of leaders should be developed today in order to ensure the sustainability of the open movement. Existing scholarly communications courses can offer an introduction, but may be insufficient to instill the values of the open education movement in LIS students. Adding an open education course to the curriculum offers benefits to both the open movement and LIS programs.

Looking Ahead

The road to a more visible presence of open education courses in LIS programs is a long one, and possibly one that may never come to fruition. Where some greater certainty lies, is that the open education course and experience reported in this study will continue for the near future. This first iteration of this course demonstrated that LIS students will enroll if given the opportunity. Future iterations of the course must build on the initial offering and continuously improve the student learning experience. One clear recommendation based on student feedback is to give more - more hours of instruction, more subject matter, more practice with the open education librarian skill set. As a long-term adjunct instructor, the author can attest it is rare to hear LIS students asking for more coursework rather than less.

Other possible course content revisions need consideration. The most likely area for change is to re-arrange the order in which some of the course material is presented. Advocacy, for example, may be better left for the third or fourth week. Whether to expand the course by adding an additional two to four weeks is another consideration. Simply stretching out the existing content by slowing down the speed with which it is presented, could add two weeks. It is more likely that there are additional topics that could be added to the course. Open education is a constantly evolving field within academia. It's possible that one or two weeks could be left open in order to incorporate the issues of the day. While all the assignments worked well, there are always emerging options for improvements and new activities to challenge and support the students' skills acquisition.

Whether or not other LIS programs introduce their own open education course is certainly the greatest unknown for the immediate future. Some programs, such as the large enrollment iSchool where the author serves as an adjunct instructor, actively seek out new courses to expand their offerings to students. They can afford to take the risk

of introducing a new, untested course. Smaller enrollment LIS programs that operate on tight margins, may be less willing to take on a new course and its associated costs, particularly if student enrollment is likely to be lean. Even the introduction of open education courses at just a few LIS programs would raise greater awareness in the open education community that there is value in inviting LIS students to join and contribute to the advancement of the movement. Afterall, with respect to members of that community who represent libraries, LIS students are our future leaders and best opportunity to achieve a sustainable future. We must find better ways to educate and include them.

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Appendix

Survey Instrument

1. Why did you register for this course? (choose all that apply)

- Heard about OER/open education in the SJSU scholarly communications course and wanted to learn more about open education
- Heard about OER on the job and wanted to learn more
- Heard about OER/open education on a listserv, at a webinar or other program and wanted to learn more
- Had not previously heard about OER/open education and was just curious
- I needed one credit and this course seemed like the best option
- Other:

2. How effectively did this course fulfill your interest to learn more about OER/open education?

1=Not at all effective

2=Somewhat effective

3=Neither effective or ineffective

4=Mostly effective

5=Highly effective

3. How likely would you be to recommend this course to a fellow student who wants to learn about open education?

1=Not at all likely

2=Somewhat likely

3=Neither likely or not likely

4=Quite likely

5=Highly likely

4. Rate your level of confidence in your knowledge of OER/open education prior to taking this course.

1=Not at all confident

2=Somewhat confident

3=Neither confident or unconfident

4=Mostly confident

5=Highly confident

5. Rate your level of confidence in your knowledge of OER/open education after taking this course.

1=Not at all confident

2=Somewhat confident

3=Neither confident or unconfident

4=Mostly confident

5=Highly confident

6. How likely is it you would apply for a professional position focusing on OER/ open education?

1=Not at all likely

2=Somewhat likely

3=Neither likely or not likely

4=Quite likely

5=Highly likely

7. How likely is it - looking ahead to your professional career - that you would attend a webinar, conference or other professional continuing education program focusing on OER/open education?

1=Not at all likely

2=Somewhat likely

3=Neither likely or not likely

4=Quite likely

5=Highly likely

8. How likely is it - following this course - that you will join the LibOER listserv?

1=Not at all likely

2=Somewhat likely

3=Neither likely or not likely

4=Quite likely

5=Highly likely

9. How likely is it - following this course - that you will subscribe to the OER Digest e-mail newsletter?

1=Not at all likely

2=Somewhat likely

3=Neither likely or not likely

4=Quite likely

5=Highly likely

10. Which do you think is the most important reason to advocate for OER/open education in K-12 or college:

- Save individual students or school districts money by not buying commercial textbooks
- Enable all students to be academically successful by having day one access to all course learning materials
- Give teachers/educators agency/control over their own course learning materials
- Advance librarianship's social justice mission by working for all students' right to have equitable access to course learning materials
- Other:

10. Should LIS programs offer a dedicated course on OER/open education?

1=Yes

2=No

3=Not sure

11. How will you apply what you learned in Open Education Librarianship?

Note: open-ended response

12. Do you have any recommendations/suggestions to share for future versions of Open Education Librarianship?

Note: open-ended response

13. Is there any other information/feedback you would like to share about Open Education Librarianship?

Note: open-ended response

The Impact of Typical Textbook Behaviors on Satisfaction with Zero Textbook Cost Materials

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Abstract

Open Educational Resources (OER) and Zero Textbook Cost (ZTC) courses have the ability to decrease the costs of higher education and provide more equitable access to learning materials. Students at a regional public master's-level institution enrolled in ZTC courses, some of which used OER, were surveyed about their satisfaction and use of ZTC materials as compared with their commercial textbook and course material use. Students generally rated high levels of satisfaction with the OER/ZTC materials. A high level of satisfaction with OER/ZTC materials is consistent with other findings. Students' attitudes and behaviors with commercial textbooks predict their OER/ZTC satisfaction. Students who are more likely to have access to textbooks in their typical courses and where costs of textbooks are less of a barrier, are more satisfied with OER/ZTC materials than those who are less likely to have access, or where costs are more of a barrier. This finding counters to what one would expect if providing more equitable access was a key influence on student satisfaction with OER/ZTC courses. These findings suggest that better understanding the relationships students have with traditional materials could improve student satisfaction and use of OER/ZTC materials.

Keywords: Open Educational Resources (OER), Zero Textbook Costs (ZTC), student survey, student satisfaction, equitable access

El impacto de los comportamientos típicos de los libros de texto en la satisfacción con materiales de costo cero para libros de texto

Resumen

Los cursos de Recursos Educativos Abiertos (REA) y Costo Cero de Libros de Texto (ZTC) tienen la capacidad de disminuir los costos de la educación superior y brindar un acceso más equitativo a

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los materiales de aprendizaje. Los estudiantes de una institución pública regional a nivel de maestría inscritos en cursos de ZTC, algunos de los cuales usaban REA, fueron encuestados sobre su satisfacción y uso de los materiales de ZTC en comparación con su uso comercial de libros de texto y material del curso. Los estudiantes generalmente calificaron altos niveles de satisfacción con los materiales OER / ZTC. Un alto nivel de satisfacción con los materiales REA / ZTC es consistente con otros hallazgos. Las actitudes y comportamientos de los estudiantes con los libros de texto comerciales predicen su satisfacción con los REA / ZTC. Los estudiantes que tienen más probabilidades de tener acceso a libros de texto en sus cursos de educación general y donde los costos de los libros de texto son una barrera menor, están más satisfechos con los materiales REA / ZTC que aquellos que tienen menos probabilidades de tener acceso, o donde los costos son más altos. una barrera. Este hallazgo contradice lo que cabría esperar si proporcionar un acceso más equitativo fuera una influencia clave en la satisfacción de los estudiantes con los cursos OER / ZTC. Estos hallazgos sugieren que una mejor comprensión de las relaciones que los estudiantes tienen con los materiales tradicionales podría mejorar la satisfacción de los estudiantes y el uso de los materiales REA / ZTC.

Palabras clave: Recursos educativos abiertos (REA), Cero costos de libros de texto (ZTC), encuesta de estudiantes, satisfacción de los estudiantes, acceso equitativo

典型课本行为对零课本费用材料满意度产生的影响

摘要

开发教育资源（OER）和零课本费用（ZTC）课程能够减少高等教育成本，并提供更公平的学习材料获取。一所地区公立院校的研究生参与了ZTC课程（其中一些人曾使用过OER），并接受了有关与商业课本和课程材料使用相比其对ZTC材料的满意度和使用情况的调研。学生普遍对OER/ZTC材料的满意度较高。其他研究也得出了与OER/ZTC材料高满意度一致的结论。学生对商业课本的态度和行为能预测其对OER/ZTC的满意度。在一般教育课程中更有可能获取课本且更能支付课本费用的学生，与不太可能获取课本、或支付课本费用存在困难的学生相比，前者对OER/ZTC的满意度更高。该研究发现与预期相反（即假设提供更公平的课本获取是学生对OER/ZTC课程满意度的关键影响因素，则会有哪些

预期）。上述研究发现暗示，对学生和传统材料之间的关系进行更深入的理解，能提高学生对OER/ZTC材料的满意度和使用情况。

关键词：开放教育资源（OER），零课本费用（ZTC），学生调研，学生满意度，公平获取

Introduction

The cost of college is rising, and virtually all courses require textbook materials (Allen & Seaman, 2014). Complicating this further, Martin et al. (2017) found that students chose not to purchase a textbook and try to pass the class without access to materials. Individual financial situations of students play an important role in this decision with more than one-third of students reporting food insecurity and more than one-third of students reporting housing insecurity in a survey of university students by Goldrick-Rab et al. (2018). The decision to not purchase textbooks can lead to problems with ill-prepared students in class and low performance on assessment measures. Spica and Biddix (pre-print) found nearly two-thirds of students reported delaying textbook purchasing, and over three percent attribute course failure to their inability to purchase a textbook. This is corroborated by Jenkins et al. (2020) in their exploration of additional textbook access barriers affecting underserved college students. These decisions also lead to campus-wide faculty adoption initiatives like the work of Brandle et al. (2019) in the CUNY system among others.

Open Educational Resources (OER) and Zero Textbook Cost (ZTC) adoption programs have become more prevalent on higher education campuses partly to counteract these rising costs, and partly to connect students with access to course materials. OpenStax (2018) defines OER as openly published, remixable textbooks and materials connecting faculty and student-learners with materials for free. While OER indicates the author or publisher allows users to download, share, edit, remix, and re-post the textbook and/or materials, ZTC courses use published materials that may not be remixable, library resources (such as articles, books, and materials). ZTC also indicates websites, videos, government websites, and more. ZTC does not carry a direct cost to students, the cost burden instead falls to institutional libraries, government organizations, and publishers with open access.

For public liberal arts institutions like Millersville University, reducing the cost of attendance and increasing textbook and material access offer strong motivations to develop incentivized adoption programs. Arguments for reducing the cost of attendance to students led to Administrative support of an OER/ZTC incentivized adoption

program. Argument for increasing student access to course materials led to large numbers of applicants to the incentivized adoption program. While OER and ZTC materials reduce student cost of attendance, Sheu and Grissett (2020) found that quality and cost both matter to student perceptions. For an institution with strong ties to our public mission, understanding the relationship between student perceptions of materials, student ability to access materials, and student attitudes about the usefulness of materials helps situate the impact of free course materials on student's ability to pass a course.

Literature Review

Research on student perceptions of OER/ZTC material is quickly growing (Hilton, 2016 & 2020 provide extensive overviews). There are diverse findings in efficacy and use, but overwhelmingly, previous research has found that ZTC materials save students money (Bliss et al., 2013; Nusbaum, Cuttler, & Swindell, 2020; Pfannenstiel et al., 2020). Previous research has explored the effect of ZTC materials on student economics and student retention and grades. Pina and Moran (2018) found an economic impact, students saved money, but they found no significant difference on grades and retention in the courses studied. Unlike Pina and Moran, Colvard et al. (2018) found OER positively impacts grades and completion rates. Other researchers explored the impact of OER adoption on student learning performance (Croteau, 2017; Clinton and Khan, 2019; Lin, 2019). As noted by Hilton (2020), the research on efficacy includes a wide range, and varied set of data.

Brandle et al. (2019) report on student positive impressions of ZTC materials, and student ability to access course materials during the first week of class. Hilton (2020) reports on perception studies and the huge variety in variables within perception datasets. Brandle et al. (2019) also point out that students may struggle to access technology that allows them to access ZTC materials.

This wide set of findings point to questions about the approaches and research questions being asked. Importantly, Grimaldi et al. (2019) raise important questions about why these findings have so many different results, raising the idea of an access hypothesis. First, Grimaldi et al. point out that "access [as] the primary mechanism for how OER might affect learning outcomes" then the variety is expected, and the approach not well-suited. As they note, a typical educational intervention impacts all students enrolled in the course. The appeal of OER is access to the textbook on the first day of classes for all students. Access on the first day as 'educational treatment' is only new for a subset of the students - students who don't purchase textbooks, students who can't afford to purchase textbooks, students who choose not to purchase immediately, etc.

Access to course materials is complex. While cost is one factor, ideas held by students about the usefulness of textbooks, the usefulness of textbooks

to their learning in a particular class, and more complicate access. Even with OER, students who struggle to pay for textbook materials may also not have technology tools to access the materials. To complicate that further, prior beliefs about textbooks, and prior experiences with passing courses without purchasing textbooks may influence student perceptions of the ZTC materials adopted.

Building on this existing research, this study explores student satisfaction with ZTC materials. We asked the following research questions:

- RQ1: Did gender significantly impact student satisfaction with ZTC, the usefulness of materials/textbooks, whether they can access or if they avoid purchasing textbooks?
- RQ2: What is the impact of costs and access on ZTC satisfaction?
- RQ3: Did student beliefs about their ability to pass a class without textbooks influence their satisfaction with OER?
- RQ4: Did expected grade predict student satisfaction with OER, the usefulness of materials/textbooks, whether they can access or if they avoid purchasing textbooks?

Methodology

Purpose

The purpose of this study was to examine the relationship between Zero Textbook Costs (ZTC) resources, student ability to access and student attitudes about the usefulness of textbook/class materials. The study also examined how much students are spending on textbooks and if this interferes with their ability to obtain the materials. The full student perception survey is available in Appendix A

Design

An expedited IRB application was approved by the Millersville IRB in September 2019. Students were informed about the purpose of the study and were invited to provide their consent before data collection occurred. Data was deleted for students who did not consent to participation but completed the survey anyway. This study was pre-experimental, cross-sectional, retrospective, and self-report.

Sampling and Data Collection

Students from 21 courses during the Fall 2019 semester were invited electronically to participate in the study for an approximate total of 1142 of students invited which resulted in 469 surveys completed. After duplicate or blank entries were removed by listwise deletion, 442 students remained.

Variables

Materials

Student attitudes were assessed by two questions regarding the (1) usefulness of textbooks or class materials to improve their grades or to (2) help them learn. Participants can respond with a 6-point Likert Scale with Strongly Disagree to Strongly Agree.

Total scores ranged from 2 to 12 with higher numbers indicating a more positive view of textbooks usefulness. The materials total composite variable has excellent internal consistency (**α**=.91, Pfannenstiel, et al., under review).

Pass

Student attitudes were assessed by a single question regarding whether or not they can pass any class without the use of textbooks/materials. Participants can respond with a 6-point Likert Scale with Strongly Disagree to Strongly Agree. Scores ranged from 1 to 6 with higher numbers indicating a more positive view of textbooks usefulness and their inability to pass a class without them and lower numbers indicating student confidence that they did not need textbook/materials to pass any class.

Access

Student access was assessed by two questions that asked about their access to all the required textbooks/materials: (1) I always purchase…(2) I have access... to all the required textbooks/materials. Participants can respond with a 6-point Likert Scale with Strongly Disagree to Strongly Agree. Higher scores indicated higher access with scores ranging from 2 to 12. The measure had adequate internal reliability (**α**=.74, Pfannenstiel, et al., under review).

Costs

Student perceptions of how cost impacted their access to textbooks was assessed by two questions: (1) Costs have led me to decline purchasing…, (2) I avoid paying for... all the required textbooks/materials. Participants can respond with a 6-point Likert Scale with Strongly Disagree to Strongly Agree. Higher scores indicated a higher likelihood that cost did not interfere with student purchase or accessing textbooks with scores ranging from 2 to 12. The measure had adequate internal reliability (**α**=.69, Pfannenstiel, et al., under review).

ZTC/OER Satisfaction

Student satisfaction with the textbooks/materials was assessed with 11 questions that were developed by the authors. Questions included assessing satisfaction, use, ease, quality, effectiveness of ZTC. Participants can respond with a 6-point Likert Scale with Strongly Disagree to Strongly Agree. Higher scores indicated higher satisfaction. The measure had excellent internal reliability (**α**=.94, Pfannenstiel, et al., under review).

Class Category

Students reported which class that they participated in that used ZTC materials. After cleaning the data, specific classes were identified (i.e., Communication 100, Communication 301) but these courses were collapsed into type or category of classes (i.e., Communication). If student input was unclear and did not provide sufficient information to determine the course, the specific course or category would be labeled as "unknown".

Descriptive Statistics

ZTC scores ranged significantly by gender and class category. Women had the highest level of satisfaction with the ZTC materials (*M*=55.2, *SD*=10.2, *N*=306) when compared to men (M=51.6, *SD*=10.7, *N*=123) and transgender students (*M*=48.8, *SD*=23.5, *N*=4). See Table 1 for gender and class category on ZTC satisfaction scores. The bolded numbers are the highest and lowest numbers in that section.

Table 1: Gender and class category on ZTC satisfaction

Class category	***M***	***SD***	***N***	***M***	***SD***	***N***	***M***	***SD***	***N***	***M***	***SD***	***N***
	Total			Male			Female			Other		
Unknown	53.7	7.7	13	**43.5**	0.7	2	55.6	6.8	11	-	-	-
Art	53.1	10.7	75	52.0	8.6	30	**53.8**	11.9	45	-	-	-
Biology	**51.8**	10.7	66	**44.8**	11.2	13	**53.5**	9.9	53	-	-	-
Communication	54.5	11.7	87	**53.7**	11.6	37	55.0	11.9	49	62.0	-	1
Education	55.4	10.2	65	46.0	15.6	4	56.0	9.6	61	-	-	-
English	**51.8**	10.8	43	48.7	7.8	18	55.7	9.2	23	**34.5**	29.0	2
Psychology	**56.8**	9.4	84	**56.5**	10.6	19	**56.8**	9.1	64	**64.0**	-	1
Total	54.1	10.6	433	51.6	10.7	123	55.2	10.2	306	48.8	23.5	4

Class category impacted level of satisfaction with the ZTC materials. Psychology students had the highest level of satisfaction and this satisfaction was stable regardless of gender (*M*=56.8, *SD*=9.4, *N*=84) whereas biology total (*M*=51.8, *SD*=10.7, *N*=66) and English total (*M*=51.8, *SD*=10.2, *N*=43) had the lowest levels of satisfaction. Psychology did not differ by gender but biology did vary greatly by gender in that females had higher satisfaction (*M*=53.5, *SD*=9.9, *N*=53) than males (*M*=44.8, *SD*=11.2, *N*=13).

Male students whose course category was unknown represented the lowest satisfaction among all groups (*M*=43.5, *SD*=.7, *N*=2) but this only represented 2 students. After the unknown group, the male students in biology (*M*=44.8, *SD*=11.2, *N*=13) and education (*M*=46.0, *SD*=15.6, *N*=4) were the next lowest satisfaction. The two course categories that had the largest difference between men and women were the unknown course category and education. Women who had an unknown course category had a 12.1 higher ZTC satisfaction score while women from education had a 10-point higher satisfaction when compared to men. One limitation with this data is that female participants (*N*=306) were at least twice as many as the male participants (*N*=123) which influenced the total scores.

Student responses for the variables, Access and Costs, are shown in Figures 1 and 2, respectively. Students generally report towards having more access to textbooks and materials as seen by the trend towards scores near the maximum score in Figure 1. Stu-

dent responses for the impact of costs on acquiring textbooks and materials is more evenly distributed along the scale, as shown in Figure 2.

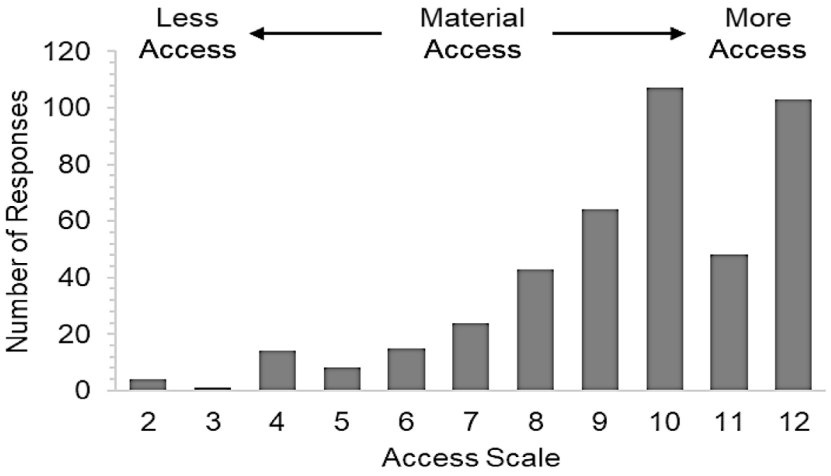

***Figure 1*:** Student responses on Access Scale. Possible values range from 2– 12 with 2 representing lowest possible access and 12 representing highest possible access.

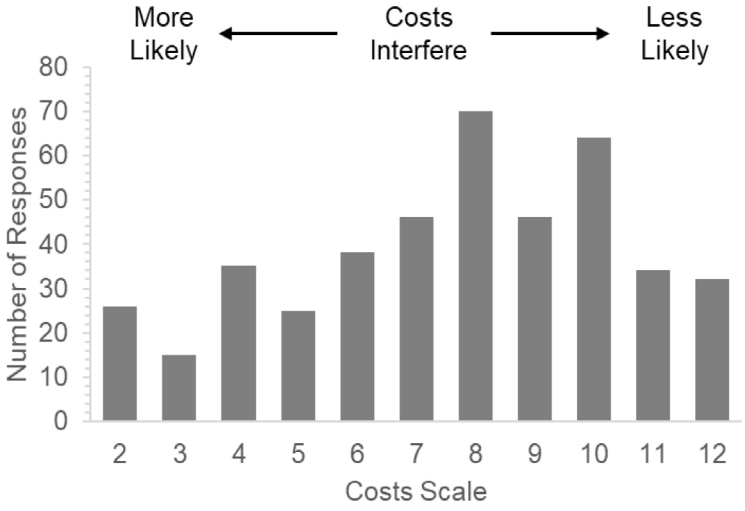

Figure 2: Student responses on Costs Scale. Possible values range from 2– 12 with 2 indicating students that it is more likely that costs interfere and 12 indicating that it is less likely that costs interfere with acquiring textbooks/materials.

Students reported broad overall ZTC satisfaction. The student ZTC response score breakdown is shown in Figure 3. The majority of responses report high satisfaction with the largest number of students reporting the highest possible satisfaction score (66).

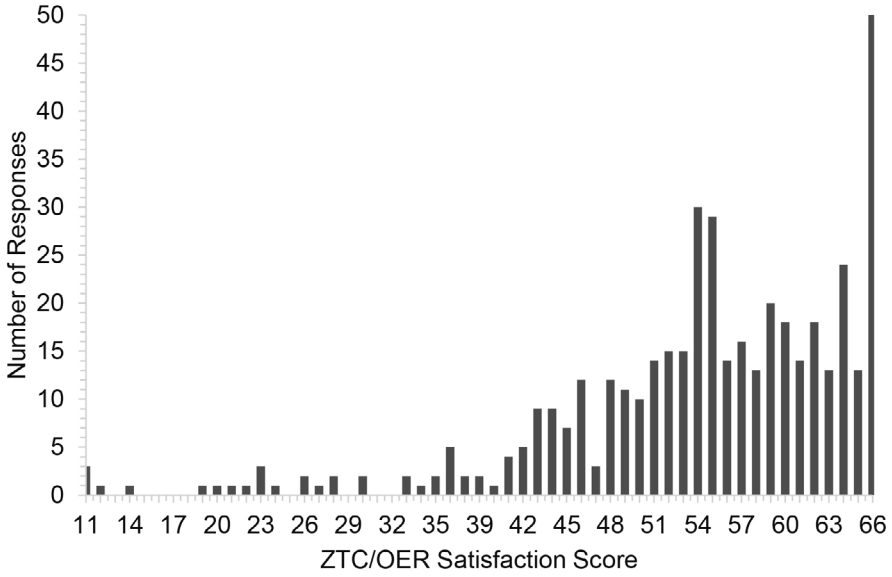

Figure 3: Student responses on ZTC/OER Satisfaction Scale. Possible values range from 11 – 66 with 11 representing lowest possible satisfaction and 66 represent highest possible satisfaction.

Results

RQ1 Did gender significantly impact student satisfaction with ZTC, the usefulness of materials/textbooks, whether they can access or if they avoid purchasing textbooks?

Independent sample T-tests were completed to determine if gender played a significant role. Females (M=55.2, SD=10.2) were significantly more likely to be satisfied with ZTC when compared to males (M=51.1, SD=10.7) F (427) = .36, $p < .001$. Females (M=9.7, SD=2.1) were significantly more likely to ensure that they have access to textbooks when compared to males (M=9.2, SD=2.3) F (425) = 3.2, $p < .05$. Gender did not significantly impact student beliefs about the usefulness of materials/textbooks nor whether they avoid purchasing textbooks. Overall females were more significantly likely to ensure that they had access to the textbooks and were more satisfied with ZTC materials.

RQ2 What is the impact of Costs & Access on ZTC satisfaction?

A multiple regression analysis was consulted to examine the predictors of **ZTC** satisfaction. Two predictors were entered into the model stepwise: access and costs. Together these predictors accounted for 12% in the variance of **ZTC** satisfaction. Both variables were significant predictors Costs (**β**=.36, p<.001) and Access (**β**=.29, p<.001). Students who report high access to textbooks/materials and that costs did not interfere with their purchase significantly predicted higher **ZTC** satisfaction.

RQ3 Did student beliefs about their ability to pass a class without textbooks influence their satisfaction with OER?

ANOVA analysis was completed to determine if the statement, "I can pass any class without textbooks/materials" would impact student satisfaction with **ZTC**. Agreeing or disagreeing with this statement had no impact on student satisfaction with **ZTC** (p=ns).

RQ4 Did expected grade predict student satisfaction with OER, the usefulness of materials/textbooks, whether they can access or if they avoid purchasing textbooks?

Students who expected a D grade (M=41.8) were significantly less likely to be satisfied with **ZTC** when compared to C (M=52), B (M=53.5), or A (M=55.5) grades. Expected grades did not significantly impact their beliefs about the usefulness of materials/textbooks, whether they can access or if they avoid purchasing textbooks.

Discussion

The results of this study are consistent with previous findings that students report high satisfaction with using ZTC materials. In this study students report relatively high satisfaction with ZTC materials over a wide-range of classes. The mean ZTC satisfaction score is 54.1 where a ZTC score of 55 represents an average rating of "agree" for all 11 Likert-scale items. If we look at responses, shown in Figure 3, that represent an average "Slightly Agree" response (44 on ZTC satisfaction score) and an average of "Agree" (55 on ZTC satisfaction score), we see that 88% of respondents have a ZTC satisfaction score of 44 or higher and 56% of respondents have a score of 55 or higher. Students who "Strongly Agreed" with every Likert-scale ZTC satisfaction question have an overall score of 66, which represents 12% of the sample. Broad student satisfaction over a wide variety of courses speaks to the quality of ZTC learning materials, effective integration of those materials within courses, and the benefits of free access.

Females are more likely than males to purchase and access textbooks for their courses and also score higher on the ZTC satisfaction score. Females as a group reporting higher general textbook access and also higher ZTC satisfaction speaks well for the quality of ZTC when compared with commercial textbooks as a group that uses commercial textbooks more views ZTC materials more favorably. This could be due to females using the ZTC materials more than males, consistent with their commercial textbook usage.

The other potential predictors of ZTC satisfaction examined showed that expected grade, students' general access to course materials, and students' general avoidance of paying for course materials are all positively associated with ZTC satisfaction. While these are all positively associated with ZTC satisfaction, they do not seem to be strong predictors as ZTC satisfaction is broadly high. For student expected grades, students expecting an A, B, or

C in the course, which represents 99% of respondents, report having similar ZTC satisfaction, but have higher satisfaction than students who are expecting a D in the course.

In the multiple-linear regression model, higher general access to course materials and higher likelihood of cost not interfering with access to course materials are associated with higher ZTC scores. The linear regression model accounts for 12% of the variance in ZTC satisfaction scores. Beta-values ($\boldsymbol{\beta}$) provide the modeled change in ZTC satisfaction given a one-unit increase in the Costs ($\boldsymbol{\beta} = 0.36$) or Access ($\boldsymbol{\beta} = 0.29$) variables. Both Costs and Access variables can vary between values of 2 and 12. The model predicts that a respondent reporting the lowest possible score (2) in the Costs category would report a ZTC satisfaction score that is on average only 3.6 points lower than a respondent who reported the highest possible score (12). The trend of students with greater typical access to materials and smaller cost barriers reporting higher ZTC satisfaction is surprising given that ZTC materials potentially have the largest impact for students who do not typically access or purchase materials. This trend, while significant, leads to relatively small differences in overall ZTC satisfaction scores which speaks to the broad positive experience students have with ZTC materials.

ZTC initiatives are often championed as providing equitable access and lower costs of attendance for students. The results here show that overall, students' satisfaction with ZTC does not trend in the expected direction. One might expect that students who are more sensitive to cost would be more satisfied with ZTC materials, but students who report being less sensitive to the costs of commercial textbooks are the ones that report an overall higher satisfaction with ZTC.

As ZTC materials are designed to provide more equitable access to materials, we might expect that students who do not typically have access to commercial course materials would view ZTC materials more favorably than students who do have access to commercial course materials. We find the opposite to be true in our sample. Students who report typically having greater access to course materials view ZTC materials more favorably than students who typically have less access to course materials. This finding might imply that students who do not typically have access to course materials have already developed habits that allow them to navigate courses without using textbooks and simply providing them more equitable access does not change their developed habits. This would imply that guiding students on using materials could be especially important once more equitable access is provided through the use of ZTC.

Alternatively, the finding that students who typically have access to course materials rate ZTC materials more favorably than those who do not typically have access could be explained by an experience effect. Students who have experience with course materials recognize that the ZTC materials are of

high quality as compared with the commercial textbooks they typically use.

The broad student satisfaction with ZTC materials is a strong indicator for success, but better understanding student past behaviors, how those learned behaviors influence their interaction with ZTC materials, and how to encourage students to develop effective behaviors for using ZTC are all critical in developing ZTC adoption movements that have a large impact for students who currently cannot access or purchase the materials when commercial textbooks are used.

Study Limitations

Students surveyed in this study are all enrolled at a Regional Master's Level institution. The faculty who taught the courses surveyed are largely either long-term ZTC users or participated in a semester-long professional development session for finding, adopting, and using ZTC. Satisfaction with ZTC could vary widely if the faculty member assigning the ZTC materials has not appropriately vetted the materials or integrated them into the course design.

Conclusion

Starting with the questions raised by Grimaldi et al. (2019) about the complications of 'access' as it relates to OER is important work. Often, student perception studies examine student perceptions of the quality of textbooks and ways of accessing materials (Lin, 2019; Bliss et al., 2013). While these studies raise important considerations, understanding student perceptions of ZTC materials based on expected grade offers needed insight to the potential impact of free materials on student grades, and impacts perceptions of access. Based on our survey, students reporting high access to course materials, who also reported costs did not interfere with their purchase significantly, generally felt more positively about ZTC materials. We can extrapolate this to mean students able to afford access to materials, who generally see them as useful, also report ZTC materials are useful. A key demographic for ZTC materials are students who may struggle to afford textbook materials. Based on our research, this group may not perceive ZTC materials with as much positive satisfaction. This has potential implications for how ZTC materials could be adopted in courses to better support student learning, adding instructional design as yet another possible complication in understanding access to ZTC and OER. While this should not hinder adopters, it is important to consider the complex interplay among student perception, cost, access, and expected grade.

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Appendix A

Student Perceptions of OER

This survey was created to understand student perceptions of OER at Millersville University. The survey was designed as part of the Open Textbook Initiative (OTI), a program that incentivized faculty to adopt Open Educational Resources (OER) and/or Zero Textbook Cost (ZTC) materials, administered through the OER Working Group. The survey has been administered to students in ZTC courses, faculty recipients of the OTI and faculty members in the OER Working Group.

Survey Authors:

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1) This survey is to help us understand student perceptions of OER. Your faculty member forwarded this survey because they have adopted OER. Please tell us which course are you currently taking that asked you to complete this survey?

a) Open ended

2) What is your major?

a) Open ended

Demographics – This information is being collected to understand more about the OER use experience. Personal information will remain confidential. Your name and M number will not be made public.

3) What is your name?

a) Open ended

4) What is your M#? (number only)

a) Open ended

5) Gender

a) Male

b) Female

c) Other

6) How many semesters have you completed at Millersville (Fall, Spring, Summer, winter)?

a) 0-30

7) How much ($) do you typically spend on textbooks each semester ($0-1000)?

a) Open ended

8) How much ($) did you spend on textbooks this semester ($0-1000)?

a) Open ended

9) On average, how much ($) do you typically spend on textbooks for any one class ($0-1000)?

a) Open ended

10) How much ($) did you spend on textbooks for this class ($0-1000)?

a) Open ended

11) In what percentage of courses do you have access to all the required textbooks/materials whether by purchasing it, borrowing, renting, course reserves or getting them for free? (0-100%)

12) On average, how many credits do you register for each Fall/Spring semester?

a) 0-21

13) On average, how many credits do you register for each Summer semester?

a) 0-21

14) On average, how many credits do you register for each Winter semester?

a) 0-21

15) What grade do you expect to earn in this class?

16) I could have passed this class without a textbook

a) Strongly disagree

b) Disagree

c) Somewhat disagree

d) Somewhat agree

e) Agree

f) Strongly agree

17) What are downsides to using electronic free textbooks?

a) Open ended

18) What else would you like to share regarding your experience using electronic free textbooks/materials?

a) Open ended

Instructions: In the following questions, free textbooks/materials will be all Open Educational Resources (OER), open materials, library resources, and other free-to-student materials adopted for this course

Scale: strongly disagree, disagree, slightly disagree, slightly agree, agree, strongly agree

19) I used/read the free course electronic textbooks/materials for this course

20) I was more satisfied to use free electronic textbooks/materials over paid textbooks/materials

21) The free electronic textbooks/materials in this course were easy to use

22) The free electronic textbooks/materials in this course were easy to understand

23) The quality of the free electronic textbooks/materials for this course were high.

24) The free textbooks/materials for this course were effective to help me learn.

25) I understood this course's content better using the free textbooks/materials than when using paid textbooks/materials.

26) I was able to put more effort into this course because of the free textbooks/materials.

27) I was able to take useful notes using the free electronic textbooks/materials just as I would have with a paid textbook.

28) I read more using free textbooks/materials than if the course required paid textbooks/materials.

29) I would register for a future course that uses free textbooks/materials like the one(s) used in this course.

Please answer these questions based on how you typically obtain or access course textbooks/materials.

30) I always purchase the required textbooks/materials.

31) I have access to all the required textbooks/materials in all my courses (either by paying for it or getting it for free).

32) Costs have led me to decline purchasing required textbooks/materials.

33) I avoid paying for required textbooks/materials.

Please answer these questions based on your typical experiences with classroom textbooks/materials.

34) Using textbooks/materials improves my grades.

35) Using textbooks/materials help me learn in classes.

36) I can pass any class without textbooks/materials.

Using a Technology Acceptance Model to Analyze Faculty Adoption and Application of Open Educational Resources

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Abstract

This research reports on a mixed methods study querying faculty who have already adopted Open Educational Resources (OER) and who might be exploring OER-enabled pedagogy (OP) in their instructional practices. Insights gained from this research fill a gap in the literature and provide a deeper understanding of the context for adopting OER, thus providing guidance and information for institutional policy and program development in support of OER implementation. In 2018, over 250 faculty responded to an online survey that queried faculty on various motivating factors for both the adoption of OER and the use of OP. Using the Unified Theory of Acceptance and Use of Technology as a design framework, this research expanded on the framework to examine motivating factors through the lens of six main constructs: 1) how individuals believed that OER have helped them perform in their job (performance expectancy), 2) the degree of ease or difficulty associated with using OER in their instruction (effort expectancy), 3) the degree to which faculty perceived if others thought it was important that they use OER (social influence), 4) the extent to which the faculty perceived that the technical and organizational infrastructure to adopt OER were available (facilitating conditions), 5) individual attitudes about the use of OER and OP (attitudes), and 6) what individuals felt they could do with the technology skills they had acquired (technology self-efficacy). Findings indicate that supporting students is one of the main motivating factors spurring faculty to adopt OER and OP. In addition, both personal and professional growth as well as networking through engaging in open education is also important. Findings also indicate the need for careful planning before introducing OP approaches. These findings have implications for future OER and OP development.

Keywords: Open Educational Resources; OER-enabled Pedagogy; UTAUT

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Uso de un modelo de aceptación de tecnología para analizar la adopción y aplicación de recursos educativos abiertos por parte del profesorado

Resumen

Esta investigación informa sobre un estudio de métodos mixtos que consulta a profesores que ya han adoptado Recursos Educativos Abiertos (REA) y que podrían estar explorando la pedagogía habilitada por REA (OP) en sus prácticas de instrucción. Los conocimientos adquiridos a partir de esta investigación llenan un vacío en la literatura y proporcionan una comprensión más profunda del contexto para la adopción de REA, proporcionando así orientación e información para el desarrollo de políticas y programas institucionales en apoyo de la implementación de REA. En 2018, más de 250 profesores respondieron a una encuesta en línea que preguntó a los profesores sobre varios factores motivadores tanto para la adopción de REA como para el uso de OP. Utilizando la Teoría Unificada de Aceptación y Uso de la Tecnología como marco de diseño, esta investigación amplió el marco para examinar los factores motivadores a través de la lente de seis constructos principales: 1) cómo los individuos creían que los REA les habían ayudado a desempeñarse en su trabajo (expectativa de desempeño), 2) el grado de facilidad o dificultad asociado con el uso de REA en su instrucción (expectativa de esfuerzo), 3) el grado en que el profesorado percibió si otros pensaban que era importante utilizar REA (influencia social), 4) el grado de que el profesorado percibió que la infraestructura técnica y organizacional para adoptar REA estaba disponible (condiciones facilitadoras), 5) actitudes individuales sobre el uso de REA y OP (actitudes), y 6) lo que los individuos sentían que podían hacer con las habilidades tecnológicas que tenían adquirida (autoeficacia tecnológica). Los resultados indican que el apoyo a los estudiantes es uno de los principales factores de motivación que impulsa a los profesores a adoptar REA y OP. Además, también es importante el crecimiento personal y profesional, así como la creación de redes a través de la participación en la educación abierta. Los hallazgos también indican la necesidad de una planificación cuidadosa antes de introducir enfoques OP. Estos hallazgos tienen implicaciones para el desarrollo futuro de REA y OP.

Palabras clave: Recursos educativos abiertos; Pedagogía habilitada para REA; UTAUT

使用技术接受模型分析教师对开放教育资源的采纳和应用

摘要

本研究描述了一项使用混合方法的调查研究，调查对象是已经采用开放教育资源（OER）且可能在其教学实践中探究OER教学（OP）的教师。该研究得出的见解填补了文献空白，并加深了对OER采纳所需情境的理解，进而在支持OER执行的过程中为机构政策和项目发展提供指导和信息。2018年，超过250名教师参与了一项网络调查，该调查询问了关于OER采纳和OP使用的不同激励因素。通过将技术接受和使用统一模型（Unified Theory of Acceptance and Use of Technology）作为设计框架，本研究对框架加以扩展，以期从6个视角分析激励因素：1）个体如何认为OER帮助他们在工作中的表现（表现期望），2）在其教学中使用OER一事的难易程度（付出期望），3）教师在多大程度上感知到他人是否认为其使用OER是重要的（社会影响），4）教师在多大程度上感知到采纳OER所需的技术和组织基础设施是可用的（促进性条件），5）个体对OER及OP使用所持的态度（态度），6）个体对其已拥有的技术能力还能做什么的感受（技术自我效能）。研究发现表明，教师采纳OER和OP的一个主要刺激因素是支持学生。此外，个人成长和专业成长，以及通过参与开放教育而建立的人际关系网也很重要。研究发现还表明，需要在引入OP方法前仔细规划。这些研究发现对未来OER和OP开发具有意义。

关键词：开放教育资源，基于OER的教学法，技术接受和使用统一模型（UTAUT)

Introduction and Literature Review

Traditionally, educational resources have been available through various commercial publishers and for a variety of costs; however, more recently, educators and administrators have been exploring the potential of low or no-cost Open Educational Resources (OER) to promote learning. These resources are defined as "material for teaching and learning that are either in the public domain or have been released under a license that allows them to be freely used, changed, or shared with others" (Sparks, 2017, n.p.). Much research has explored various aspects of OER, such as perceptions of the resource, student efficacy and out-

comes (Anderson, Gaines, Leachman, & Williamson, 2017; Hilton III, 2019; Magro & Tabaei, 2020). In addition, a great deal of research has focused on the use of OER, especially in terms of potential cost savings for students (Hilton III, Robinson, Wiley, & Ackerman, 2014; Lashley, Cummings-Sauls, Bennett, & Lindshield, 2017; Magro & Tabaei, 2020). As of 2017, the U.S. Bureau of Labor Statistics reported that the cost of textbooks has risen by 142% over the last decade and a half, representing a rate four times that of inflation (U. S. Bureau of Labor Statistics, 2017). Senack (2015) also noted that, tuition aside, textbook costs represent the second-greatest expense for college students. Clearly, development and use of OER could go far to help relieve some of the economic stress experienced by our student population.

Research has also shown that student recruitment can be positively impacted when OER are employed (Nikoi & Armellini, 2012). Higher retention rates and lower withdrawal rates have been evidenced, as well, when utilizing OER (Hilton III, Fischer, Wiley, & Williams, 2016). In addition, pedagogical variety can be explored when using OER, which might lead teachers to reflect on their use of content and approaches in their teaching (Jhangiani & Green, 2018; Kazakoff-Lane, 2014; Nascimbeni & Burgos, 2019). In order to explore the benefits of and to promote the growth and potential application of these resources, research is needed to investigate the skills and context required to adopt, reuse, develop, and apply OER (Amiel, 2013; DeVries, 2013; Paskevicius & Irvine, 2019). As indicated in the literature, a significant number of students who are already struggling with tuition and housing costs will choose not to purchase textbooks, even knowing that this might affect success in a course (Prasad & Usagawa, 2014). Reduced student loan debt and higher program completion rates for students have also been credited to the use of OER (Bowen, Chingos, Lack, & Nygrn, 2012; Hilton III, 2016; Hilton III, Gaudet, Clark, Robinson, & Wiley, 2013). In order to enhance student success in the pursuit of higher education, more research needs to be conducted into the factors that could potentially motivate faculty to adopt and develop OER and to explore open teaching strategies leading to student success. Though there is a continued trend in faculty awareness of OER, their awareness and concerns about traditional publishers do not always result in adoption of OER (Seaman & Seaman, 2018). More research is needed regarding factors influencing faculty adoption of OER if the potential benefits and pedagogical impact are to be fully realized.

This research explored various factors that have played a role in influencing faculty adoption and application of OER and open practices, such as OER-enabled pedagogy (OP) in instruction. OP has been defined by Wiley and Hilton III (2018) as "the set of teaching and learning practices that are only possible or practical in the context of the 5R permissions which are characteristic of OER" (p. 135). The "5R" permissions refer to the right to retain, reuse, revise, remix, and redistribute re-

sources as this material is released with copyright licenses that provide this freedom (Wiley & Hilton III, 2018). Others, as well, have discussed an open pedagogical approach to learning by using OER and other open resources (Cronin, 2017; Jhangiani & Green, 2018; Weller, 2014).

In examining the literature on faculty adoption of OER, studies have addressed reasons for non-adoption of OER by faculty (Kursun, Cagiltay, & Can, 2014; Ngimwa & Wilson, 2012; Tovar & Piedra, 2014). Anderson, Gaines, Leachman, and Williamson (2017) found that there was no consistent understanding of OER among the faculty in their study. They also found that some faculty were unsure of where to locate quality OER and expressed a concern about overall quality. Krelja -Kurelovic (2016) found that, though faculty at one Croatian university reported positive attitudes towards OER, there was very little actual sharing of teaching material. In contrast to studies where researchers have speculated on faculty adoption of OER, the current research focused on various influencing factors motivating adoption by faculty *who have already adopted OER* in their teaching and who may be experimenting with applying OP.

The literature includes a number of studies examining the potential of faculty to adopt OER. In a study designed to measure the readiness of faculty and staff to adopt OER, McKerlich, Ives, and McGreal (2013) found that motivation in adopting OER was largely intrinsic. They found that "recognition" for both creation and use of OER was the lowest factor reported by study respondents and suggested that this might mean that it is intrinsic motivation that drives faculty in this situation (McKerlich et al., 2013). In fact in another study, Pawlowski (2012) suggested that emotional ownership is the key to overcoming barriers of OER adoption. Ownership was also found to be an important element by researchers Algers and Silva-Fletcher (2015). In a study collecting data from 52 institutions, the researchers found that altruism was important in determining whether teachers would potentially share OER (Algers & Silva-Fletcher, 2015). In another study published in 2013, which surveyed instructors from all levels of education on their sharing behavior with respect to OER, Van Acker, van Buuren, Krijins, and Vermeulen (2013) found that altruism was positively correlated with the intention to share OER. They also concluded that this finding implied that teachers enjoy the behavior of sharing OER, without the need for additional extrinsic incentives (Van Acker et al., 2013). Altruistic motivation for making learning material accessible has also been noted in a variety of other research studies (McGill, Falconer, Dempster, Littlejohn, & Beetham, 2013; Pegler, 2012; Scheliga & Friesike, 2014). In addition, researchers Paskevicius and Irvine (2019) found that faculty reported being driven to use OER by a "spirit of openness" (p. 7).

In a 2016 study on the general perceptions of OER, Belikov and Bodily examined barriers and incentives for faculty to adopt OER and uncovered

several motivating factors. They found that some faculty (10.6%) were motivated to adopt OER in order to cut costs of material for student convenience and for enhancing equity; a smaller percent of faculty (9%) indicated that pedagogical benefits would motivate them to invest the time into evaluating OER (Belikov & Bodily, 2016). Other studies have shown that providing a cost savings to students is one of the highest motivating factors in the consideration to adopt OER by instructional faculty and staff (McKerlich et al., 2013; Tillinghast, 2015).

In their research on open science, Scheliga and Friesike (2014) found that faculty participants were willing to sacrifice rewards to be able to engage in experimenting with new forms of disseminating knowledge and from the sense of joy experienced from sharing knowledge. Chae and Jenkins (2015) found somewhat similar results in their qualitative investigation of faculty using OER in the Washington Community and Technical College System. These researchers reported that two major motivating factors for faculty to use OER were the desire to provide access to academic material at a low cost and their own pursuit of pedagogical freedom (Chae & Jenkins, 2015). Hassall and Lewis (2017) conducted a study at the University of Leeds examining both institutional and technological barriers to the use of OER. What they found indicated that there was no innate motivational barrier to adoption but that rather the lack of motivation comes from a lack of opportunity (Hassall & Lewis, 2017). One external factor that could influence a faculty decision to adopt or create OER might be in the form of institutional support. In the Scheliga and Friesike study (2014), it was recommended that constraints to open behavior can be diminished if this behavior is rewarded within the research culture and by the research institution. On the other hand, in one study at a North American university, Veletsianos discussed how institutional policies might potentially affect adoption (2015). Veletsianos described the institution of focus as one lacking institutional support for openness. Though some open and sharing practices were evident, this author suggested that "individual (rather than systemic) motivators may be significant drivers of openness in the higher education context" and not those of institutional policies or initiatives (Veletsianos, 2015, p. 205). Jhangiani, Pitt, Hendricks, Key, and Lalonde (2016) studied faculty at different types of institutions of higher learning in Canada—research-intensive, teaching-intensive, and colleges or institutes. They found that faculty at research-intensive universities were more likely to engage with OER than faculty at the other two types of institutions (Jhangiani et al., 2016). Finally, in a study that presented a different picture and that focused on three South African universities, Cox and Trotter (2016) conducted interviews with academic participants engaged in OER workshops designed to promote OER. The researchers wanted to learn what types of interventions might work best for motivating OER adoption and use in different academic institutional con-

texts. They concluded that institutional policy should not be regarded as a motivating factor for OER activity due to the individual institutional culture, which "mediates the role that policy plays in academics' decision making" (Cox & Trotter, 2016, p. 9).

The concept of open educational practices (OEP), including the use of open resources, is in a fairly nascent state in higher education. Cronin's definition of OEP includes the use of OER but extends to the use of open pedagogies and open practices of sharing as well (2017), with the central pedagogical premise being that of learning empowerment for both students and teachers (Jhangiani & Green, 2018). Some researchers have argued that, for the potential of OER to become fully realized, it needs to be accompanied by a radical change in educational practice (Masterman, 2016). Koseoglu, Bozkurt, and Havemann (2020) indicated that OEP moves beyond only the use of OER to include open approaches to learning, teaching, pedagogy and scholarship, as well as the use of open data and software. Others have discussed how OEP can be redesigned to better redress social injustice (Bali, Cronin, & Jhangiani, 2020). In fact, these authors offered a typology of OER that moves from content centric to process centric, from teacher centric to learner centric, and from a primarily pedagogical focus to a primarily social justice focus (Bali, Cronin, & Jhangiani, 2020). Their work built, in part, on that of Hodgkinson-Williams and Trotter (2018), who introduced an OER, OEP, and Social Justice framework that focused on economic, cultural, and political dimensions and associated ameliorative responses (Hodgkinson-Williams & Trotter, 2018).

In one study, Cronin (2017) sought to understand the perception and use of OEP in higher education. Data from semi-structured interviews indicated a continuum of practices existed, with values ranging from closed to open (Cronin, 2017). In a study at the University of Oxford, Masterman (2016) reported that one approach to increase uptake in OEP is through the encouragement in the use of OER as it aligns with the concept that students are "citizens of tomorrow." Havemann (2020) presented a case study at one London university and suggested that "it may be most productive to conceive of instances of educational practices as always *both/and,* deriving from an interplay of open and closed elements" (p. 10). Some researchers have voiced the opinion that teaching and learning with OER are not new phenomena but reflect long standing theories such as Social Constructivism and cognitive learning practices (Beetham, Falconer, McGill, & Littlejohn, 2012; Panke & Seufert, 2013). One author discussed a "learner-generated" approach to open educational practices and indicated it is one of eight attributes of open pedagogy (Hegarty, 2015). This author claimed that something "magical" happens when students become fully involved in the learning process (Hegarty, 2015). In addition, Hodgkinson-Williams and Paskevicius (2012) conducted a study involving student-assisted reworking of academic material into

open resources, noting the many positive benefits to the process. In fact, Baran and AlZoubi (2020) suggested that the greatest value of open pedagogy is in providing awareness of open access as well as promoting student agency. In one study, Wiley, Webb, Weston and Tonks (2017) found that overall student grades increased in a statistically significant manner during the time frame when increasingly student-created OER were added to a course. Singer (2018) described how OEP are used to help students understand how they can take control over their own education in an institution using competency-based education and prior learning assessment. In a paper discussing a move from using open resources to the exploration of open pedagogy, DeRosa and Robinson (2017) discussed how faculty who use openly-licensed resources can explore the possibilities of creating new relationships between learners and the information they access within a course. They stated that when students are exposed to the use and reuse of learning resources, they begin to develop a new relationship with resources, one which becomes even stronger if faculty involve their students in the critique and contribution to the body of knowledge with which they are engaged (DeRosa & Robinson, 2017). These researchers also stated that "open pedagogy uses OER as a jumping-off point for remaking our courses so that they become not just repositories for content, but platforms for learning, collaboration, and engagement with the world outside of the classroom" (DeRosa & Robinson, 2017, p. 117).

If faculty are motivated to explore, adopt, or create OER, other possibilities could then be open to them. Faculty would be able to explore the affordances of open resources and how they might potentially impact their teaching. In fact, recent research has indicated that a positive correlation exists between the use of OER and the adoption of engaging and open teaching methods (Nascimbeni & Burgos, 2019). It is this researcher's hope that the insights gained from this research will fill a gap in the literature and potentially provide a deeper understanding of the context for adopting OER. This might provide guidance and information for institutional policy and program development in support of OER implementation, which could, in turn, help to promote pedagogical exploration.

Methodology

An explanatory sequential mixed method design was employed to address the research questions in this study. This particular research approach was applied in order to gather general data from a larger population of faculty in higher education and then to focus more specifically on the perceptions of those factors influencing the adoption of OER and the possible application of OP with a smaller sample of faculty interviewees.

Participants

Participants were identified by colleagues who were working in the area of Open Education. Faculty or instructors

were identified by a colleague at their institution as being someone already using OER and who might be applying OP in their instruction. Invitations to complete an online survey were sent to 1,100 faculty and instructors across the U.S., with a final count of 234 complete responses used as the quantitative data source and the open-ended qualitative source. Participants represented faculty and instructors of all ages and from community colleges to research institutions. In addition to the quantitative data collection, survey participants were invited to take part in a follow-up semi-structured interview. Fifteen face-to-face and phone interviews explored perceptions pertaining to OER and OP adoption more deeply than was possible on the quantitative survey.

The Research Model

The Unified Theory of Acceptance and Use of Technology (UTAUT) framework was used to guide the development of operationalized questions applicable to this research. Prior research applying the UTAUT framework to examine influencing factors pertaining to OER adoption helped to guide question formation for this research as well. For example, the work of Mtebe and Raisamo (2014a) in Tanzania applied the UTAUT to query faculty about their intentions to adopt OER, and Dulle and Minishi-Majanja (2011) conducted an Open Access adoption study applying UTAUT. This research was based on the work of Venkatesh, Morris, Davis, and Davis (2003), whose permission was given to adapt questions for this research. Questions for the interview were also based on operationalized questions from former UTAUT research, in which reliability analysis and construct validity tests were applied (Dulle & Minishi-Majanja, 2011; Kandiero, 2015; Li, Yuen, & Wong, 2014; Mtebe & Raisamo, 2014a; Percy & Van Belle, 2012). A Likert scale was used to record responses on the survey. In addition, several demographic questions were added to address information represented by the modifiers from the UTAUT model.

The UTAUT model for this research included six main constructs: performance expectancy, effort expectancy, social influence, facilitating conditions, attitude, and technology self-efficacy. Venkatesh et al. (2003) defined *Performance Expectancy* as the degree to which an individual believes that using the system will help him or her to attain gains in job performance including domains such as perceived usefulness, extrinsic motivation, job-fit, relative advance, and outcome expectations. These authors indicated that *Performance Expectancy* is the strongest predictor of intention to use new technology. *Effort Expectancy* is defined as the degree of ease associated with the use of the system (Venkatesh et al., 2003). The domains captured within this construct are perceived ease of use, complexity, and ease of use. *Social Influence* is the degree to which an individual perceives that important others believe he or she should use the new system and is represented by subjective norm, social factors, and image in earlier technology models (Venkatesh et al., 2003). This construct acknowledg-

es that an individual's behavior is ultimately influenced by their perception of how others in their sphere of influence will view them as a result of their use of a particular technology (Venkatesh et al., 2003). These researchers tell us that this construct is not as significant in voluntary contexts but operates by influencing perceptions about the technology (2003). *Facilitating Conditions* are the degree to which an individual believes that the organizational infrastructure and the technical infrastructure both exist in order to support the use of the technology and includes perceived behavioral control and compatibility (Venkatesh et al, 2003). Finally, two constructs were added from the original UTAUT model, those of *Attitude* and *Technology Self-efficacy* (Dulle & Minishi-Majanja, 2011; Venkatesh et al., 2003). *Attitude* refers to an individual's positive or negative feelings related to the technology, and *Technology Self-efficacy* is the confidence that is demonstrated in making decisions about use of computer and technology resources (Yussoff, 2009). These two constructs were dropped in later models of UTAUT because it was determined that they may not influence behavioral intention. Because this research was not concerned with intention but with actual use and because others researching the topic of the use of open resources and OER have included one or both of those constructs (Dulle & Minishi-Majanja, 2011; Percy & Van Belle, 2012), this research included questions in the instruments based on those constructs. The design framework used to support the research was modified and is depicted in Figure 1.

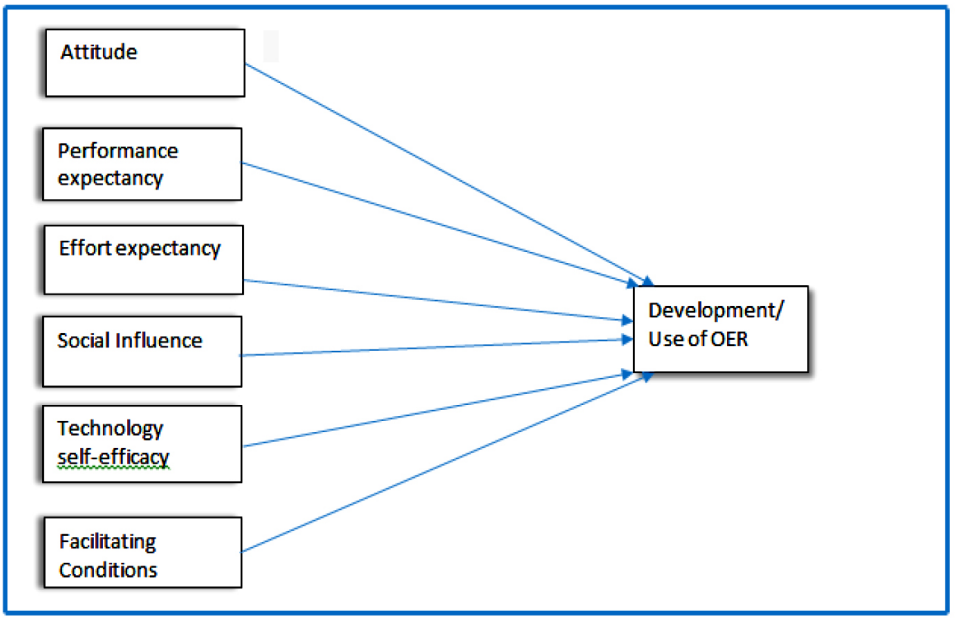

Figure 1. Modified Unified Theory of Acceptance and Use of Technology Design Framework

The Research Questions

This study, based on the constructs from the UTAUT model, explored 1) how individuals believed that OER have helped them perform in their job (performance expectancy), 2) the degree of ease or difficulty associated with using OER in their instruction (effort expectancy), 3) the degree to which the faculty perceived that others think it was important that they use OER (social influence), 4) the extent to which the faculty perceived that the technical and organizational infrastructure to adopt OER were available (facilitating conditions), 5) individual attitudes about the use of OER and OP (attitudes), and 6) what individuals felt they could do with the technology skills they had acquired (technology self-efficacy).

The first research question was addressed by the quantitative phase of the study, while research question number two was addressed through the data collected in the qualitative phase of the study.

> RQ#1. What are the factors that have informed the decision to adopt OER and possibly OER-enabled pedagogy by higher education faculty?
>
> RQ#2. What are the perceptions pertaining to OER and OER-enabled pedagogy by higher education faculty who have already adopted OER?

Data Collection and Analysis

Data were collected via an online questionnaire (see Appendix A), as well as face-to-face and phone interviews (see Appendix B). Questions for this study were operationalized and developed considering the UTAUT framework and helped to examine factors that had influenced faculty who had already adopted OER and who may have been applying OP. As previously mentioned, participants were contacted via email for the quantitative and qualitative sections of the research. In the online survey, quantitative data were collected, which included several open-ended questions to collect qualitative data. Interviews were arranged either through face-to-face contact or through phone conversations for qualitative data collection and were recorded with participant permission and later transcribed. Using a code recode approach (Saldana, 2009), data were thematically analyzed in alignment with the UTAUT model while allowing for other emerging themes.

Data from the quantitative survey were recorded using a 5-point Likert scale, and responses from the survey were aggregated using descriptive statistics. Central tendency was determined using median, and the frequency or percentages of the responses were used in order to build a picture and describe the reported variables that had influenced OER or OER-enabled pedagogical adoption by faculty. Qualitative data were imported into a computer assisted qualitative data analysis software program for coding, categorizing, and thematic analysis. In this way, the words of the faculty were used to deepen understanding and give voice to the participants (Corden & Sainsbury, 2006).

Findings

This mixed method research explored perceptions of faculty who had adopted OER for instruction and may have used OP. Quantitative and qualitative findings are presented separately in the following sections.

Quantitative Data

Participants. Faculty participating in this study reported teaching at almost 100 institutions across the U. S. with over 65% teaching for ten or more years (see Table 1). Over half were in tenure track positions, and the majority were full-time faculty (84%). Age fell roughly into three main categories, ranging from 35 to 55 plus. Responses indicated that the majority had been teaching using OER less than six years at 91%. The majority taught at the undergraduate level (82.5%) with most of the remainder teaching both undergraduate and graduate levels (15.0%).

Table 1. The Demographic Profile of Faculty Respondents to a Survey on OER (n=234)

Classification	Percentage
Age	
Under 35	7.7
35-44	35.5
45-54	30.3
55+	26.5
Tenure Status	
Tenured	54.6
Tenure track, not tenured	10.0
Non-tenure track	35.4
Teaching Status	
Full-time faculty	83.8
Part-time faculty	4.7
Adjunct instructor	6.0
Other	5.6

Note. Other = Professionals such as teaching assistants or special lecturers.

Performance expectancy. This construct is the degree to which an individual believes using the system will help him or her to attain gains in job performance (Venkatesh et al., 2003). The data from the survey indicated that faculty and instructors felt strongly (76% agreed) that there was a benefit to using OER in their instruction (see Figure 2).

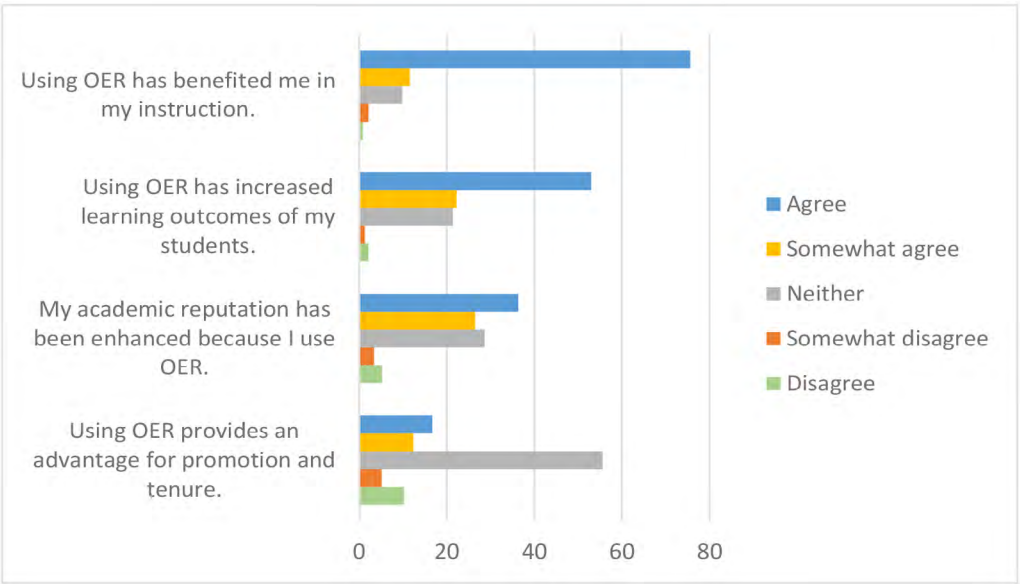

Figure 2. Survey responses for questions pertaining to Performance Expectancy related to OER

More than half of the respondents (53%) agreed that OER increased the learning outcomes of their students. Though 22% of respondents neither agreed nor disagreed that using OER had enhanced their reputation, over one-third (36%) agreed it did with an additional 27% somewhat agreeing. A majority (56%) felt the use of OER neither helped nor hindered the promotion and tenure process, and less than a third of participants (29%) felt that it would benefit promotion or tenure.

Effort expectancy. This construct is defined as the degree of ease associated with the use of the system (Venkatesh et al., 2003), and the domains within this construct are perceived ease of use, complexity, and ease of use. The continuum of introducing OER into courses often begins with finding suitable OER, adapting or creating an OER, and then integrating the OER into a specific course. Quantitative data explored the ease with which faculty and instructors were able to locate OER, and a majority (74%) somewhat to strongly agreed it was easy to find class material (see Figure 3).

A greater majority of respondents indicated they somewhat agreed or agreed that adapting and creating material was easy (78%). Finally, survey participants responded that they somewhat agreed or agreed (74%) that the integration of OER into their classes was a fairly easy process.

Social influence. This construct represents the degree to which an individual perceives that others in the professional context believe he or she should use the new technology (Venkatesh et al., 2003). Quantitative data indicated that more respondents (59%) disagreed to somewhat disagreed that they were

influenced by others around them who were using OER, with just over one-fourth (27%) indicating that they were influenced by others (see Figure 4). However, almost 38% somewhat agreed to agreed that their departments felt it was important to use OER, and a full 61% felt that their OER work was favorably viewed by the institution. Only 15% of participants indicated that they thought students expected OER to be offered in their courses.

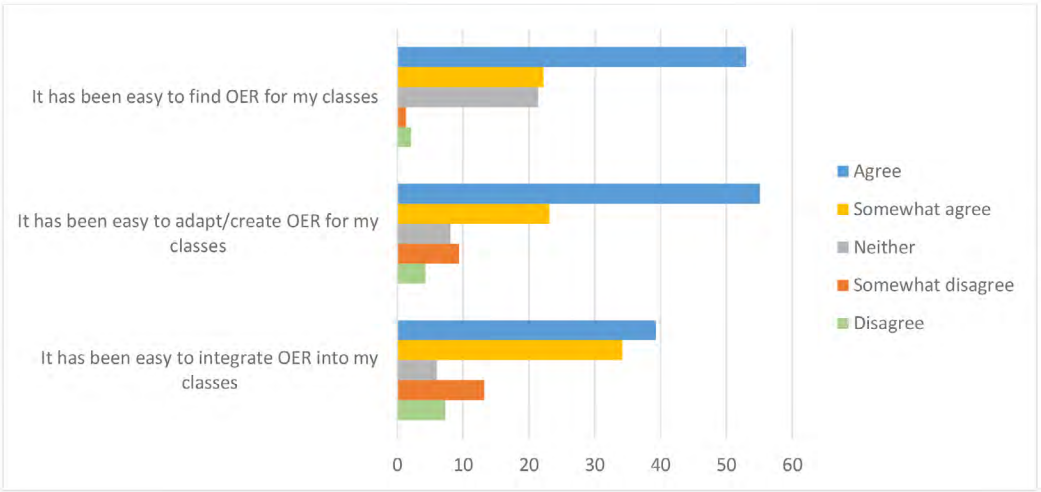

Figure 3. Survey responses for questions pertaining to Effort Expectancy related to OER

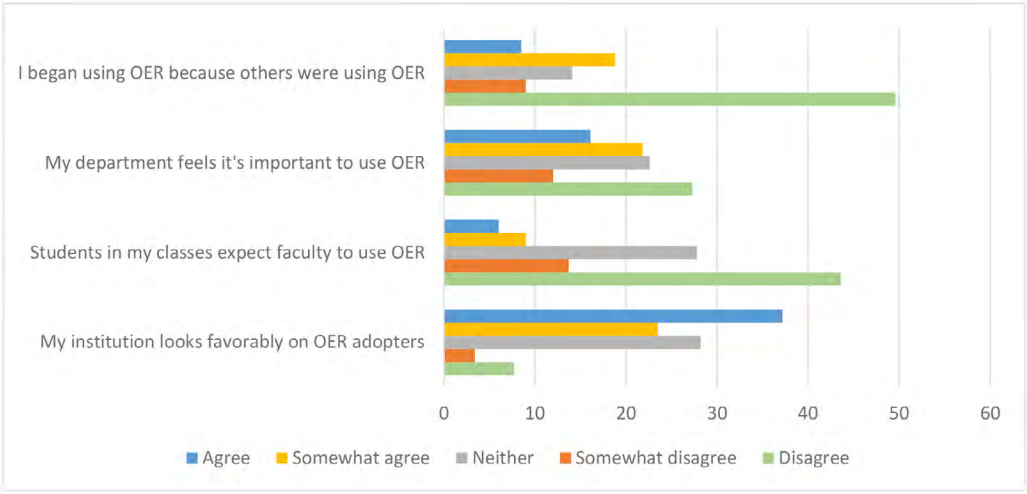

Figure 4. Survey responses for questions pertaining to Social Influence related to OER

Facilitating conditions. This construct refers to the amount of support an individual believes he or she will be given to use a new technology and the extent to which the new technology is compatible with one's philosophy (Venkatesh et al., 2003). Though approximately one-third (34%) of respondents disagreed that campus guidance was provided when they began using OER, more than

half of respondents (57%) felt that guidance was in place on their campus (see Figure 5).

A greater number of survey respondents (65%) felt that campus resources were made available when they were ready to explore and implement OER. In terms of the survey respondents' belief that OER helped facilitate their instruction and were compatible with their instructional philosophy, data indicated strong agreement (82%).

Attitude. This refers to an individual's positive or negative feelings related to the technology (Yussoff, 2009). Respondents on the survey indicated that they somewhat to strongly agreed (92%) that sharing the OER they created was important (see Figure 6). They also indicated that they expected other faculty to equally share the OER that they created (90%). Slightly more than half (51%) of respondents felt that working with OER enabled them to pursue their research interest.

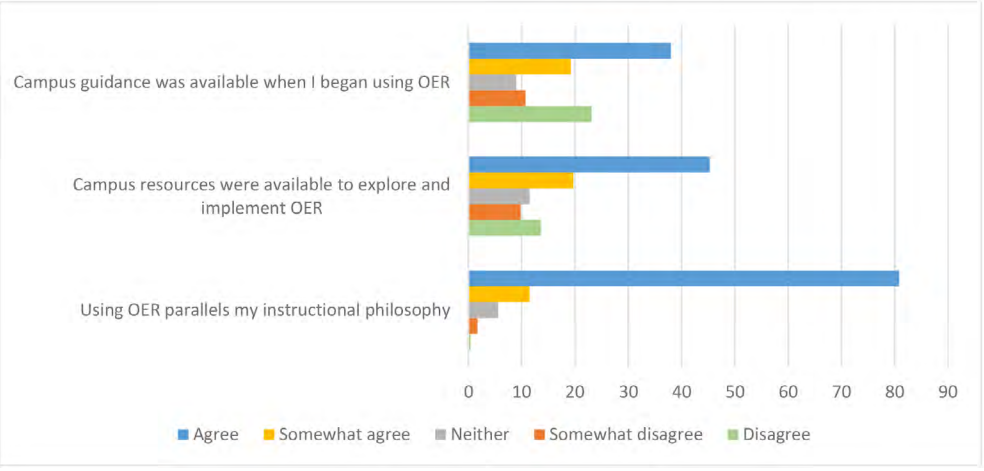

Figure 5. Survey Responses for Questions Pertaining to Facilitating Conditions Related to OER

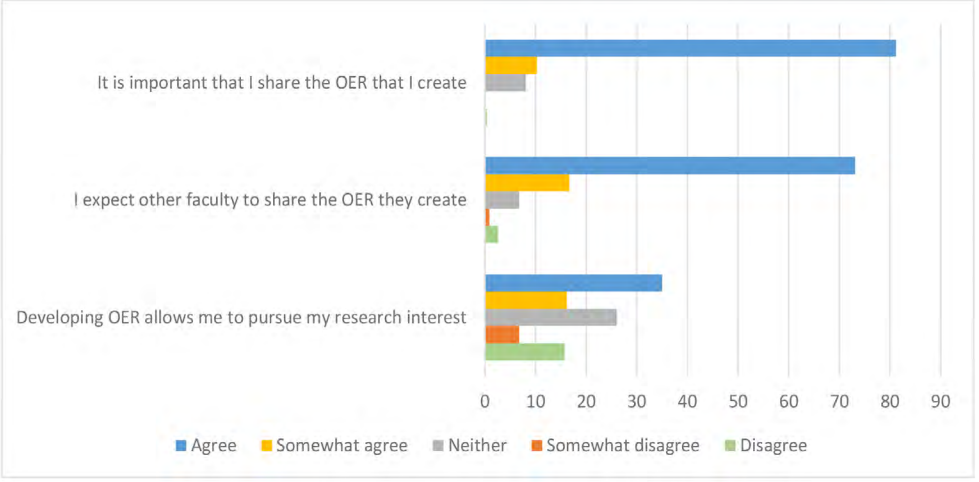

Figure 6. Survey Responses for Questions Pertaining to Attitude Related to OER

Technology self-efficacy. This construct indicates the confidence that is demonstrated in making decisions about the use of technology resources (Yussoff, 2009). For this study, self-efficacy applies to the skills needed to adopt OER, develop or modify OER, and apply the correct licenses to the resources. As shown in Figure 7, quantitative data indicated a self-reported high level of skill for adoption at the time they began using OER (83%). Currently, most faculty (90%) felt they had the technical skills for developing and modifying OER. Data also indicated a high level of understanding (90%) in the selection and application of the appropriate copyright licensing to the resources for distribution.

OER-enabled pedagogy. One survey question inquired as to whether participants were now or had ever applied OP in their courses. A brief explanation of OP was included on the questionnaire. Of the 234 respondents, 47% responded in the affirmative, with the remainder indicating they had not applied OP in their instruction (53%). Several open-ended survey questions followed, the data from which are explored in the qualitative section.

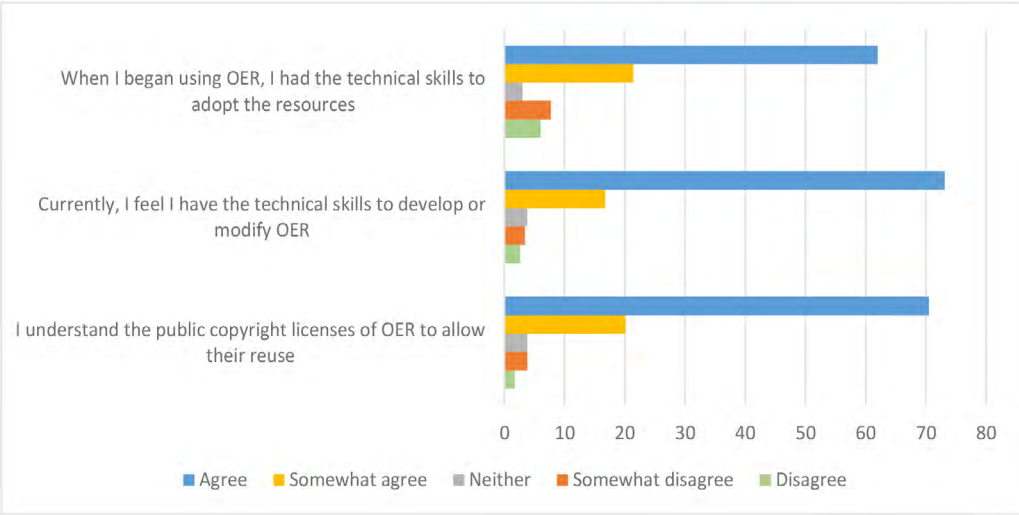

Figure 7. Survey Responses for Questions Pertaining to Technology Self-efficacy Related to OER

Qualitative Data

Qualitative data were collected from open-ended questions on the survey and from follow-up interviews. Approximately 90% of participants responded to open-ended questions on the survey adding to the qualitative data collected from 15 subsequent interviews. Of the interviewees, 60% taught at community colleges with the remaining 40% teaching at four-year colleges and universities.

Performance expectancy. During the interviews, and as indicated on the open-ended survey questions, participants relayed that working with and us-

ing OER helped them in their job performance. A number of themes related to performance expectancy emerged from the data. These included (1) benefits to teaching and learning, (2) opportunities for personal and professional growth, (3) increased visibility and impact on reputations, and (4) encouraging institutional interplay.

Benefits to teaching and learning. Survey respondent open-ended data and interview data indicated three ways that participants believed OER benefited the teaching and learning process. These included providing better access to materials, reducing costs for students, and affording the ability of instructors to customize resources.

Most interview participants discussed the positive impact that their use of OER had on student learning. The fact that using an OER for a course provided instant resource access for students was very important for the interviewees. One participant mentioned that she covered a great deal of information in an undergraduate biology class and that having the OER textbook at the beginning of the course "is critical to [student] success because I don't have enough time in class to go over every new term and every concept. So, I'm asking them to do the reading first before they come to class and then come to class prepared so we can go through things." Another participant mentioned, "I was convinced that at least half of the class wasn't buying the textbook before [introducing an OER]. So anecdotally, I think my students do better because they can access the text." Discussions of access also included the important American Disabilities Act (ADA) access provided through ADA-compliant OER and having access to OER formatted for multiple devices. One issue pertaining to access was that of limited Internet coverage in some rural areas of the United States. One participant shared that students "all have access at least while they're on campus, but then there are the limitations when you leave campus. That's why accessibility on various devices is really important."

If the cost associated with textbooks is removed from the educational-cost equation for students, faculty and instructors viewed this as positive for the learning and teaching process and, in fact, some viewed it as a matter of social justice. When cost is removed, access is then immediate and provides support for student success. This concept was repeated numerous times in the open-ended data from the survey: "It allows students who are socially and economically disadvantaged to have the same chance as the rest of the students." One participant indicated that because of the no-cost textbook he offers, "I keep more students in the class … because the students at least have an opportunity to be successful … just because the cost itself is less of a barrier." Cost can be an extreme barrier in low-income areas. One interviewee shared, "We are low cost, open access, high, high, high poverty area here. It's not everybody anymore, but I still think [our student body] is over 80% Pell Grant eligible."

Many participants felt that their teaching was enhanced because they could customize—even immediately—

the resources in their courses by "building on the 5 R's." One participant spoke about "putting together lessons with just the right amount [of information] that added richness and quality material. This directly impacts the student experience because they can see, for example, a documentary that just came out yesterday in Spain." Another shared that being able to customize the OER "… has given me more control on the content of the book by making it more relevant to the course, to my teaching, and the things I'm trying to emphasize in my teaching content-wise." One participant also shared, "Too often textbooks drive the curriculum. By creating my own OER, I've been able to modify it to meet the learning goals set by our state and by our local population of students." Many benefits were mentioned by participants in terms of the ability to customize an OER: an ease of editing as students gave feedback on the resource, which would promote ownership and empower the students to give informative feedback; the ability to add fresh, relevant information; putting the development of the content into the hands of experts – not publishers; the freedom to localize the content for relevance; a freedom from copyright restrictions; and the ability to add material in various formats to address different learning styles.

Provides personal/professional growth. Several of the participants were excited about the skills they were developing by tackling an OER project. One shared, "For me the value of [developing OER] is that it pushes me to extend myself beyond my comfort zone, so I can bring more information to my students. So, it benefits my learning as well." Another participant, discussing developing OER for an institutional program, said, "It was really a growth experience, you know. Communicating with the university for permission to use certain aspects of the university's website, going to trainings for textbook creation. So that, I feel, was a great professional learning experience." One participant commented about the experience of becoming a better teacher. "I think [developing OER] provides me the opportunity to be more engaged in the learning itself. I think it makes me, I hope, a much better instructor."

Data indicated that professional growth opportunities open when faculty and instructors adopt teaching and learning with OER. Various opportunities were mentioned: becoming involved in a new research study; attending different conferences and workshops; becoming a new co-curriculum developer; taking on the role of liaison with administration; and becoming a campus lead in OER development. One participant shared, "I know some of my colleagues have been reluctant to try this on their own. But they see me working with OER and are inspired. Providing support for them has made me a better teacher, too."

An overwhelming number of participants identified the importance of networking and collaboration as part of their personal and professional growth. One participant shared, "I think it's nice to be in the OER community and talk to other people about what technology they're using and how things are going and what topics they

are covering… It's been really positive for me professionally and really makes my job easier in the classroom." Another participant was very excited about the "… amazing Twitter and social media network of folks that are working in OER, and there's a constant river of information that I feel like I'm keyed into now that I wasn't before I was using OER." This type of connection can also produce collaborative works. One participant mentioned jointly developing material that later was adopted nationally and internationally. "It was not just collaboration. It was a genuine intellectual fusion where the sum was way more than any of the parts could be. My colleagues are very collaborative. … Personally, it was very satisfying to me." This type of networking also allows faster access to resources.

Increases visibility and impacts reputation. Several participants felt that their professional reputation had been positively affected by their use of OER. However, one participant mentioned, "There's nothing that I've done that would warrant a reputation of some kind. I just do what I do because I love what I do." Another participant mentioned "the students feel that they are part of something new, and they're part of something exciting." In fact, some participants shared how their involvement with OER was viewed very positively by students. Another participant mentioned that "my students have become involved and will go by [other faculty's] offices and say, 'Hey, I've taken your course before. This was how the cost of the textbook was a challenge for me.'" Several participants mentioned that their colleagues were impressed that they had applied for and received grants to develop OER. Several others also mentioned that their reputation was being enhanced because of their work with colleagues across their campuses. One participant shared, "I've actually had the opportunity to speak to people that I wouldn't have normally because I was advocating for OER." Other participants mentioned that their work with OER had been recognized by the administration on their campus. One participant shared that "there are many deans and directors and provosts, and now chancellors who know of me by name." Another participant explained, "… when our small department completed the [OER] textbooks, I feel like that's brought some degree of visibility to the department for the wider university. And then also some recognition, potentially, at the state and national levels for using this kind of innovative curricular [resource]." One other participant mentioned that, after developing OER for their department, they were able to offer "zero-cost" courses, which resulted in a rise in their enrollment. She shared that "this is very beneficial to our department … bringing in more funds for the college so we can expand our program. I mean it's just a domino effect." Another participant mentioned that by sharing a collaboratively-developed OER that the contributors were able to "get their name on [an OER publication] that is out there beyond our walls here, which is really great. … Usefulness, visibility, prestige. I think it's contributed all those things to our department."

Encourages institutional interplay. The impact of offering OER can extend to a broader institutional level. One participant mentioned that their community college campus claimed to have saved students over $200,000 dollars a term as a handful of instructors launched OER in their courses. This participant also shared that since launching OER, completion rates have risen. This can bring awareness and potential funding to support OER development. Another mentioned that he has concentrated on sharing his teaching resources through the college's learning management system. "This has benefited my school's relationship with the company that made the system. I've spoken at conferences and have helped my school become more connected to an online learning network of sharing."

Participants also discussed institutional recognition of their efforts developing and implementing OER. Findings indicated that there is no direct positive influence on promotion and tenure through OER involvement, though indirect benefits were mentioned. Participants at four-year institutions indicated they were not recognized formally in the promotion and tenure process. However, one participant mentioned the advantage of "being able to speak about [creating and promoting OER] as part of my teaching philosophy when I go up next for promotion." Another shared that "the OER movement has allowed me to become an OER Ambassador on campus and to participate in a state-wide program development project," which would enhance a CV. Others discussed indirect ways that involvement with OER would be viewed positively by an institution: being able to speak about involvement during the hiring process; participating in OER-related committee work; completing certified workshop training; researching and publishing on topics related to OER; and creating and promoting newly-design curriculum using OER.

Effort expectancy. Participants also shared various aspects of finding, adapting, creating, and then integrating these resources in their practice. Themes that emerged from this data included that OER adoption and development are motivated by pragmatic factors, that the context strongly helps to determine the approach taken and the ease of adoption, and, finally, integration is not a difficult task.

Pragmatic motivators for adoption. It might be assumed that student savings is the sole reason that faculty and instructors would want to adopt OER, but the qualitative data revealed that other pertinent reasons exist: to reduce wastefulness; a dissatisfaction with department resource recommendations; a desire to create relevant material; and to share with a wider community. One participant mentioned a "growing dissatisfaction with rising textbook costs and the charges that go with it." This participant discussed a "textbook that was $320 … and the lab manual, that's another $150 or $180. … And with new editions coming out all the time, and there's no change. That's just stupid. … When I realized how easy open textbooks could be, I was like,

'Just do it!'" A number of participants were very aware of the potential wastefulness when they required students to purchase a text and then required only a portion to be used. One discussed using a commercial textbook that was required by the department and "would tell my students, 'This book is going to cost you $200, and you're only going to read ten or twenty percent of it. Sorry.'" One participant shared, "I had worked in business for years, and I had my own material that I had used as a consultant. My material was much more relevant to what students would need in the business world, so I just put together my own resource." One participant shared that she became involved with OER when taking part in a project to develop an entirely new curriculum for the university. "These were new classes, and we decided to write the textbook specifically for the classes." Another participant shared, "I transitioned to using OER when I began teaching online. It only made sense to me to offer my material online. I also wanted to share with everybody. Not just my students, but with a larger community. … To me, that's a big motivator."

Context determines approach and ease of adoption. Insights from the interviews and open-ended survey data revealed that there were multiple approaches and varied phases as part of the adoption process. This was dependent on context and individual circumstances. Several participants shared that they enjoyed the process of finding OER that were available through repositories of open textbooks. "OpenStax is a pretty good resource, and they vet the material. … It's the same kind of content and quality that you get with your traditional textbook. So that's relatively easy to adopt." Besides using a repository of vetted work, another faculty mentioned the importance of networking to find resources by "either going through the conferences [for resource recommendations] or talking to other people. Going to statewide meetings. Identifying experts and contacting them for ideas." One participant, who had created their own OER in the past, shared that now, "I spend a lot more time searching than I do creating. It's not less effort, but it's different. It seems like a more reusable effort … because I think we duplicate a lot."

Regarding adapting and creating OER appropriate for a course, participants indicated that the effort varied with the circumstances. One shared, "With no textbook available for this lower division class, no open material in that field, … it's been a real challenge to bring that course up to a similar standard [as my other class] with OER." One participant was an experienced teacher and shared that she had a lot of material that had been created over the years but experienced a different challenge when, along with a colleague, they tried consolidating their material into one text: "The content was not the issue, but learning how to put that all together and create the flow and consistent language. We ended up having to bring in an editor to kind of look at the finished product and polish it for us." Many participants shared that creating their own OER was time consuming, and at times, there was a steep learning curve.

One participant reported working on a basic public speaking text and shared, "… the creation of a textbook like that - 15 chapters, over 400 pages, desk-top published, Creative Commons license - is EXTREMELY time consuming, and I don't know if I'd recommend it." She did continue to share that "… the book has been used in 12 other institutions that I know of and has been downloaded 14,000 times," which was rewarding. Another participant shared that most instructors "have the experience of creating ancillary material, so creating OER is just an extension [of this experience]."

Integration not difficult. One participant felt that introducing a new OER text into instruction was "similar to integrating other commercial material." However, another felt that integrating OER was emotionally easier because it hadn't involved a large financial investment, "I didn't have to adopt it and get the students to buy it and then discover it wasn't working well. … and I could change it as we went along." One participant mentioned that, regarding maintaining one's own online resources as opposed to trying to stay abreast of changing commercial textbook versions, "has been more consistent for me than [using commercial] textbooks. It's less work maintaining. More work setting up, but less work maintaining," in the end saving time. Another participant commented, "Oh, it's a lot of work, not difficult, but a lot of work … but it should be a lot of work … to find and to integrate anything new into your classes. That's what we do."

Social influence. Interview participants and survey respondents reflected on a variety of social influences that led them to adopt OER. This social influence could come from colleagues, the open source community, the culture of their institution, or empathy for students.

Some of the participants relayed that they had been influenced to adopt OER because of colleagues, especially in their departments, though not by the department administration. One participant shared that their English "staff was so enthusiastic about [using OER] and pitching it, we unified together and presented [the idea] to our department." One participant mentioned being inspired by the open source community, while several others indicated that they were hired into new positions where there was already a culture of using OER and cited institutional support as the main influence in their use of OER. Some of the participants felt that they were influenced by their own frustration as students, as they had struggled with the cost of schooling. One shared a story while being a student, "… no small part of [being influenced to use OER] was the fact that I was like some of these students. I'm a first-generation college student. I come from a single parent household, and a pretty troubled one at that, so when I went to college, it was kind of sink or swim. There was no support. There were some semesters where I was actually homeless, and it was a big challenge getting through college. … So, I think we need to be doing better for our students."

Facilitating conditions. Data were collected regarding both the organizational infrastructure available to support adopting OER as well as the compatibility with instructional philosophy. Participants shared information that evidenced two main themes related to facilitating conditions: 1) providing support leads to results, and 2) the use of OER reflects teaching philosophy.

Providing support leads to results. Although two of the participants shared that they had begun work with OER very early on, when no formal support was provided, the overall data showed that currently support exists through various means at most institutions. Several universities organized presentations about OER use. At one campus, a special technology unit exists that began to encourage OER development. Having the support from this unit made the difference in one participant's experience with OER: "So I tried OER on my own like three years ago, and on my own I kind of failed. Then the next year, I applied for something called FITC, an institute of technology … helping faculty stay current in technology. There's a big emphasis for OER, and I had the opportunity to then become an OER Ambassador." Some institutions offered special programs like the OER Ambassador program or a special Pathways Program that supported developing OER material. Several participants shared that their institutions had a dedicated librarian or some form of library support for OER. Another participant spoke about one of their librarians. "Besides the state-wide initiative, we've had one digital initiatives librarian with a huge interest in [OER]. She's the liaison who manages [our efforts], who helps us through the process and kind of shepherds us, and then she also is the person who will help us with updates." Data indicated that some form of grant program was offered at a number of institutions. Grants took a variety of forms in the different institutions: stipends were made available for faculty interested in modifying courses to incorporate OER; specials grants for the creation of new OER; professional development grants for conference attendance; salary supplements for introducing OER; special grants for formal research on OER; small grants to review Open Textbook Network material; grants for upkeep and maintenance of previously-developed OER; and grants offered through student organizations providing iPads. Other participants suggested that they felt they were indirectly supported at their institutions by not being deterred from experimenting with OER. One participant admitted, "Other than the grant, it was mostly just not getting in my way, that they supported the idea that I was going to adopt a book that I was writing … and were also very happy with the cost." Finally, some participants indicated that they worked in institutions in a state that had organized state-wide OER initiatives, which in turn have promoted both grant programs and state-wide conferences supporting OER adoption and development.

Use of OER reflects teaching philosophy. Many participants shared that adopting and creating OER was a direct accompaniment to their instructional

philosophy and helped to facilitate their instruction. One participant shared that "I teach my classes as storytelling classes, with the idea that the students tell their own versions of the stories that we're reading in classes. So, it's a remix … as students are working with public domain material. It's ready to be reused and remixed in whatever ways they want to do that." Another shared that using online information "allows us to consider origin, to understand authorship, and to understand ownership … and starts a whole new conversation." Three different participants mentioned their collaborative approach to instruction. One specifically mentioned how the use of OER could model a constructivist philosophy to teaching: "So, I like to watch students building their own knowledge, and I think it can be helpful for them to see that I'm actually building the knowledge that we use in class as well." Several participants felt that the flexibility of revising OER supported their approach to instruction as it helped them make the material relevant and localized and helped to promote engagement. Finally, a number of different participants mentioned that OER and open practices supported a larger philosophy about education. They spoke about the right that every person should have to an education.

Attitude. Data collected for this construct indicated two themes: satisfaction was derived from working with OER and there was an overwhelming sense that sharing of resources was positive.

Derive personal and professional satisfaction. Many participants expressed some form of satisfaction in working with OER. Some mentioned that working with OER was fun and challenging in a positive way and that being an author was rewarding. One mentioned the pleasure in "taking satisfaction in the fact that money isn't going to Pearson and McGraw." Several participants felt they were a part of a larger, more important movement to support students. One stated, "I think it's exciting to be a part of a team. Working with something that is free to the students. I think it's exciting to be part of something new." A good number of the participants felt that great satisfaction was gained because students were being served better as the result of the use of OER. Another participant expressed a frustration that often undergraduate textbooks weren't written for a student newly entering the community college environment. "The assumptions about 18-year olds in [commercial textbooks] is pretty different. So, finding a textbook that I could edit to make relevant to my students … has been really satisfying —to find things that work for them." A number of participants mentioned that the ability to edit the textbook was very satisfying. One also mentioned that "If you'd told me 25 or 30 years ago that I would be able to spend my time reading 16th century books that I can get for free online, and then repurposing them and sharing them with new audiences, I wouldn't have believed it. It's incredible!" Several participants shared how working in OER supported their research efforts. Several were conducting OER-related research in their classes. Participants also mentioned the per-

sonal satisfaction that comes with the ability to share. One participant agreed that it was very satisfying to have your work "adopted by faculty across the nation and into Canada. So, I feel like maybe I've gained a little prestige, professionally, in the sense that I kind of feel like this important author. People are using my work across the country in their classrooms. And people email me, 'This is great. Thanks for putting this together.'"

Sharing supports global progress. Much of the data indicated a very positive attitude toward sharing resources. Evidence of this came from one participant discussing how a colleague in another state requested instructional material. The participant shared, "… anything I have, I'll share. So, I ended up sending her all of my exams, and quizzes, and all of my lab activities. So, it just seems like we faculty keep having to reinvent the wheel because we're working in these little islands, or silos. I mean, the more we share, the more streamlined this process gets - and easier. It becomes more globally collaborative." Another participant mentioned the transition to feeling comfortable in sharing. "I worried just a minute that [sharing work globally] would undercut my own research or might give away ideas … but now that I've had some experience with it, I've only had positive experiences in sharing information. … And then you get these amazing threads of amazing people that link to all the work that's available for free from researchers that they love." Several participants discussed how working and sharing online promotes greater exposure of work, which can sometimes be uncomfortable. One participant, while sharing work at a conference, was somewhat unnerved by what was perceived as harsh criticism of the OER being presented; however, most respondents felt similarly to one participant: "For me the sharing has been great. Once again, it's a personal thing, but also a professional thing. I really believe in networked learning, networked knowledge, and so by sharing my stuff, I've been able to build a really important personal network of people that I collaborate with, that I can ask for help, that I feel connected to through the material that we work on."

Technology self-efficacy. Data were collected regarding to what extent faculty and instructors believed in their ability to be successful working with OER. Two themes emerged from the data. First, technology skills are important. Second, you need knowledge of the licenses in order to make resources openly available.

Technology skills important. Participants generally felt that they were technology savvy. However, one participant, who was adopting an OER, admitted, "I don't consider myself tech savvy at all. … having a supportive library staff helps [finding material]. But I don't think I needed the skills that I thought I needed to be able to find these [resources]." Another admitted that "I think I'm fairly tech savvy, and it was pretty easy for me to understand and to put a lot of this [OER] together, whereas my co-author was not as savvy. And I think she felt more challenged by it. But I don't

think that should be a reason not to do it because there are lots of resources to help people with the technical aspects." This participant also admitted appreciating the "help of the digital initiatives librarian, who made the process easier." Another participant admitted, "In terms of barriers to OER, [tech skills] can be a big one." The aspect of technology also extends to students who will be using the OER. One participant advised that instructors need to consider how students will be using the OER: "… if I'm not explicit, I spend more time answering technical questions about how to access [the OER] than I do about the content of the text."

Need knowledge of licenses. Most participants were aware of Creative Commons (CC) licenses that are applied to OER. One participant admitted that "Until I started doing this, I didn't really have a full comprehension of the differences in the licenses and how to give attribution. I do understand them now, but I don't understand why … some people don't want their material changed. Do they really understand the license? You should be able to use the resource in the way that you need to for whatever you're teaching." Another participant spoke about how the concept of CC licenses was "really foreign" and "we're going to have to do some work on [learning about CC] because we've been so scared of violating copyright throughout our careers."

OER-enabled pedagogy. Qualitative data for this topic were collected from open-ended survey questions and from interviews and helped to identify certain themes in this area. These themes indicated that OP could be realized in many ways and there were benefits in teaching and learning; however, there also were obstacles in applying OP

Realized in many forms. Data revealed many different types of activities that participants identified as OP. Examples included student-created lessons, study guides, full sections of the curriculum, glossaries, bibliographies, chapter introductions or whole chapters, and supplemental practice problems to support texts. The highest number of OP activities centered around student-generated content for wikis, blogs, and webpages, followed by student-selected articles and material to be incorporated into a course. Three participants shared that their students had created an entire OER. One participant indicated that "under my supervision, students in my classes created a history of psychology textbook." Several others mentioned students developing banks of quizzes and study questions to incorporate into courses. One participant mentioned how frustrating it was not to find OER for a behavior analysis course that then prompted an OP approach to the problem. "So, I walked into my upper division behavior analysis course —with seniors and graduate students— and I bring in copies of different texts and say, 'Let's talk about OER, you guys. Let's talk about this. I want you to read this and tell me what you think.'" Students ended up working on a Psychology 400 OER for future classes. Another participant mentioned having students "write additional sections [of the course textbook] that they felt would be target-

ed to community college students and creating local guides to go with [the textbook]."

Benefits to teaching and learning. Just as was realized in the findings regarding the benefits of OER, the application of OP benefits both teaching and learning as well. Many participants commented that they felt the OP approach increased student engagement and motivation. This realization provided the motivation for them to experiment with OP. Many other participants felt that students took more ownership of their learning and felt like they were building a learning community when involved with OP. One participant shared, "[Students] act like experts, responsible for their own education and learning." Another participant shared an additional benefit: "[Creating OER] gives them a practical or tangible artifact that represents an outcome instead of saying, 'We're just going to learn about this.' They have something they created that they can use again and that they have ownership of, basically." Another participant shared, "It's just been a wonderful experience all the way around, not only because [students] become authors and they get to demonstrate their competence in a particular topic, but because they see that in actual practice [creating information] gets messy. It's a real-life experience." This same participant also shared how applying OP is basic to teaching philosophy. "For me it's a philosophical position I've always held … that idea of student-centered learning. The students should ask the questions. The students should find the answers; we're just here to facilitate that process. So open pedagogy and the fact that we can have these information networks now allow me to implement the philosophy that I've had all along about teaching, that in a classroom is so hard." Finally, one participant shared, "The earlier that students understand that they are a part of the academic conversation, that their voices are of value and a worthy contribution, the better students they become and ideally better citizens."

Obstacles in applying OP. Data shed light on some of the frustrating aspects in implementing OP. One participant shared that "[Students] seem more engaged with [OP] but also sometimes more frustrated because it is not as cut and dried as a regular type of assignment." Another indicated, "At the undergraduate level, I find students very intimidated by open pedagogy. It has been a learning experience for me to adjust assignments that account for the intellectual confidence levels." Another participant also disclosed, "I think it has made them more interested, but also a little bit more frustrated because it does require them to work a little bit harder; however, once given guidance and allowance to make mistakes, each [student] found value in the process." One participant also discussed one aspect of the process: "… in part about me becoming comfortable with letting students try to be the authors, to try to be the creators." Other participants reflected on why they haven't become involved with OP: the logistics would be difficult; not wanting to single out particular student work to include in OER; the curriculum is too tight; the desire

for a very concise textbook; and the fear that it would take a lot of extra preparation. Finally, one participant felt the pressure from administrative economic concerns: "Trying open pedagogy for the first time can lead to frustration … and as long as we're in the era of declining enrollment and declining funding, there's a lot of pressure for certain metrics, like completion retention, and so experimentation in teaching can be hard to do in that climate."

Discussion

This research explored various factors influencing faculty adoption and application of OER and OER-enabled pedagogy in instruction. It is organized through, but not limited to, the UTAUT framework in order to provide a structure for reflecting on the data by examining the expectations for performance and effort, social and institutional influences, as well as attitude and the types of technology skills supporting OER and OP application. These findings are important in that they illuminate various facets of an instructor's path through the process of selection, adoption, creation, and application of OER. A small number of studies have utilized a technology acceptance theoretical framework with which to study instructor perceptions and acceptance of OER (Kandiero, 2015; Kelly, 2014; Mtebe & Raisamo, 2014a) and even fewer have focused on factors motivating the adoption of OER from the perspective of faculty who have already adopted OER (Coleman-Prisco, 2016). This research is fairly unique in that it surveyed faculty and instructors who are already using OER, from the perspective of a technology acceptance theory. Data are also unique in that they give insight into the on-the-ground application of OP, prompting a deeper reflection on this process. As in the Coleman-Prisco (2016) study, data from this research indicate that supporting students is one of the main motivating factors spurring faculty to adopt OER and OP. Data reveal the importance of personal and professional growth and of networking for faculty and instructors through engaging in open education. Findings also indicate the need for careful thought and planning in terms of instructional context and student experience in higher education when applying OP.

Performance Expectancy

This research indicates that performance is enhanced by using OER. Faculty and instructors feel that using OER benefits their instruction as well as the learning outcomes of their students, which is congruent with other research in this area (Coleman-Prisco, 2016). Qualitative data identified issues that enhance performance: immediate and multiple ways that students can access learning material; reduced textbook costs to provide equitable access; and the ability to customize material. These all enhance the teaching and learning experience. In regard to access, cost, and ability to customize OER, other research has indicated similar results (Chae & Jenkins, 2015; Hilton III, Robinson, Wiley, &

Ackerman, 2014; Jhangiani & Jhangiani, 2017; Lashley, Cummings-Sauls, Bennett, & Lindshield, 2017; Seaman & Seaman, 2017).

Qualitative data further revealed that many participants, especially in the interview research, felt very positive that working with OER provided opportunities for personal and professional growth, including interfacing with new colleagues and administration. This finding does not easily connect with current research. Belikov and Bodily (2016) did, however, report that a small percent of faculty had indicated that various pedagogical benefits would motive them to investigate OER. Though research has indicated that seeking prestige is not a motivator for adopting OER (Van Acker et al., 2013) this research finds that a large majority of faculty and instructors do feel that their work in open education has increased their reputation. However, previous research has indicated much lower agreement (Hodgkinson-Williams, 2010; Sclater, 2010). Regarding benefits for promotion and tenure, these data do not indicate that there is a strong, direct benefit as a result of working with OER or OP. This is consistent with other research. There is little empirical work that explicitly addresses this issue (Thoms, Burns, & Thoms, 2018), though limited research has indicated a disconnect between the value assigned to open scholarship and institutional policies (Jhangiani et al., 2016; McKiernan, 2017). Data from this research provide a rich context for personal and professional growth and the interplay between the individual and the institution, which reflect on performance expectancy.

Effort Expectancy

Findings in this construct indicate that there are multiple and pragmatic motivators for faculty and instructors to embrace OER adoption, with varying levels of effort. Data reveal that it is often the instructional context that determines the best approach to adoption and the ease of execution. This study's qualitative data provided a good sense of the actual effort and process of finding, adopting, creating, and integrating OER. Interview data revealed that finding appropriate material is fairly easy, while creating material is much more challenging, though rewarding. The integration process mirrors the integration of any new material and is considered an integral part of instruction. These findings are consistent with findings from similar studies that have focused on the potential effort in adoption of OER (Anderson et al., 2017; Dulle & Minishi-Majanja, 2011; Mtebe & Raisamo, 2014b; Percy & Van Belle, 2012) but with the difference of providing more in-depth reporting of qualitative data.

Social Influence

Findings indicate that various types of social factors influence the adoption process: via colleagues, departments, students, and the institution. Respondents in this research indicate collegial influence in approximately a quarter of the situations. Survey data

also indicate the influence of departmental support at a rate greater than from institutional support in this study, with less support indicated through the interviews. Though other research has indicated the hypothetical importance of collegial and departmental support (Coleman-Prisco, 2016; McKerlich et al., 2013) research indicating actual support is not evident. Both quantitative and qualitative data from this study indicate that the influence from student expectations is small, and little research has been conducted supporting this aspect of social influence. Two exceptions are related studies that indicated students viewed those faculty using OER much more favorably than those using a traditional textbook (Vojtech & Grissett, 2017) and a recent study that indicated students felt teachers should freely share their teaching resources (Pound & Bostock, 2019). However, the qualitative data indicate empathy for students is a motivator, which appears to be based on participants' experience as students. The assumption of a positive institutional perception of those using OER is reported by more than half of the survey respondents though this perception isn't as evident with interview participants. No outside research was found to substantiate these findings.

Facilitating Conditions

Institutional support appears to be in place in over half of the institutions represented by survey respondents. This is not consistent with current research on the extent of actual institutional support, which has indicated that funding still needs a wider support base (Cox & Trotter, 2016; Dutta, 2016; McGowan, 2019). This finding is logical, however, because the current study examines the institutional influence on subjects who are actually using OER, while other research has focused on the projected needs at the institution to support OER development. Resent research by Maina, Santos-Hermosa, Mancini and Ortiz (2020) also indicate the need for both specific training and for institutional support in order to succeed in the implementation of OP. Regarding the data relating to the compatibility of OER use with instructional philosophy, a large percent (82%) of survey participants report this alignment while all the interview data support this concept. It was difficult to relate these concrete findings to other research, which has dealt with more general philosophical exploration of "openness" (Deimann & Farrow, 2013; Jhangiani et al., 2016; Wiley, 2006), as the context of this research is on those who have already adopted OER.

Attitude

This research data indicate a strong belief in sharing the work that is self-created as well as the work of others. These findings are consistent with some research on sharing (Schuwer & Janssen, 2018; Tillinghast, 2020; Tseng & Kuo, 2013), though other research has indicated a lower rate in the belief of sharing (Banzato, 2012; Van Acker et al., 2013). Data also indicate that working with OER fosters

the opportunity to pursue research. In addition, the qualitative interview data reveal that faculty and instructors, who work with OER and OP, derive personal and professional satisfaction in doing so. This has been evidenced in prior research as well (Rolfe, 2012).

Technology Self-efficacy

The quantitative and qualitative data are in alignment for this construct: technology skills are needed, especially for developing and modifying OER. In lieu of individual skills, technology support needs to be available. Findings from this study are congruent with other research, which has found that individuals with a higher overall sense of computer efficacy are more likely to find OER easy to use (Kelly, 2014) and that adequate technology skills can be a barrier to OER development (Muganda, Samzugi, & Mallinson, 2016). However other recent research counters this assumption, indicating no significant difference between users and nonusers of OER in the degree of comfort with technology (Hassall & Lewis, 2017). An inadequate knowledge of copyright and licensing for open material can also be a barrier to adoption. This research indicates that respondents are fairly well-versed with licensing of OER. This is most likely due to the fact that all participants are involved in some aspect of OER and OP; however, current research has indicated a need for faculty and instructors to more fully understand copyright and CC licensing in order to promote OER development (Hassall & Lewis, 2017; Muganda et al., 2016; Paskevicius & Irvine, 2019; Seaman & Seaman, 2018). One finding that emerges from this research is that faculty and instructors need to be aware of how their students will interface with the OER. Some students struggle with the technology needed to access and manipulate the resource, while other students may experience restrictions to accessing computers and the Internet. While the latter finding has been indicated in other research (Ally & Samaka, 2016; Liebenberg, Chetty, & Prinsloo, 2012), the former does not appear to have been addressed in the literature.

OER-enabled Pedagogy

Quantitative and qualitative data are not parallel for this topic, as the quantitative data indicate a higher experimentation and use of OP than is evidenced through the qualitative data. It became clear when reviewing the open-ended data on the survey that a number of participants were conflating OP with the use of OER in their courses. This would account, in part, for the different proportion of individuals on the survey claiming to have used OP in their instruction. The concept of OP is in alignment with ideas presented by some of the current scholarly discussions promoting the development of new pedagogical methods that enable transparency, communication, and engagement (Dalsgaard & Threstrup, 2015). This is congruent with some research that found that educators using OER and OP felt they were agents of change and innovation (Paskevicius & Irvine, 2019; Pitt, Jordan, de los Arcos,

Farrow, & Weller, 2020). Nascimbeni (2020) explored the competences that university educators should master for open and networked teaching. He indicated that educators aren't required to master new competences but rather adapt their teaching strategies to collaborative learning settings (Nascimbeni, 2020). Finally, the current research is also consistent with other research in that some participants felt that by using OER they were stimulated to bring about changes in their teaching role and to explore other avenues of openness in their pedagogical approach (Nascimbeni & Burgos, 2019; Tur, Havemann, Marsh, Keefer, & Nascimbeni, 2020).

This research captures the excitement and positive outlook of others who are experimenting with OP and who believe that engaging in this approach to pedagogy and shifting to a student-centered approach can help to equip students with the necessary skills to live and work in an open world (DeRosa & Robinson, 2017; Hilton III, Wiley, Chaffee, Darrow, Cuilmett, Harper, & Hilton, 2019; Masterman, 2016; Tillinghast, 2020; Woodward & Kimmons, 2017). Contemporary educators can help to prepare students to become engaged learners, learners who are knowledge producers and not just knowledge consumers (Nascimbeni, 2020).

Implications

Findings from this research have helped to shed light on the actual use of OER and application of OP in various institutions across the U. S. Findings have also exposed new limitations of practices as well as reemphasized limitations that have been brought to light in prior literature. These limitations have implications for future OER and OP experimentation and development. The implementation of OER and OP can be realized either through a top-down institutional approach or through a grass-roots approach. In either case, having a champion is imperative—a committed faculty member or department, a librarian, an instructional designer, a committed administrator. This research indicates that personal and professional growth is an important motivating factor in adopting open practices. Workshops that emphasize professional development, student success, and research possibilities might assist in laying the groundwork for open practices. Networks found on campus, within institutional systems, and beyond help to provide support for OER development and interested instructors and faculty should be made aware of these. Networked connections in terms of supporting organizations such as the OpenTextbook Network, the Rebus Community, and the Scholarly Publishing and Academic Resources Coalition (SPARC) organizations provide another source of support. Technology support is critical and could include support in locating resources, adoption, adaption, creation, and integration of OER, as well as untangling the nuances of copyright and licensing. Though not documented empirically in the literature, this research indicates that intuitional or state-wide support especially encourages the development of OER through grant programs and stipends.

Institutions need to rethink promotion and tenure practices to be inclusive of work happening around open practices. Data drive many institutional initiatives, so institution-specific research needs to be conducted in order to frame development at a specific institution. These data could then be shared with the larger community to support more global efforts. Finally, the concept of open practices, with implications for pedagogical exploration, needs on-the-ground research if practical application is to be realized.

Limitations

It is recognized that a small sample size will affect the generalizability of the findings (Leung, 2015). However, the methodology for this research was well documented in support of easy replication in order to boost reliability. Bias is always a possible factor when a single researcher is responsible for interpreting the data (Bryman, 2012). By requesting feedback from colleagues involved in OER research, by striving for the highest ethical standards, and by employing member check of interview transcripts, bias has been kept at a minimum (Bryman, 2012). It is also recognized that data collected in this research were self-reported, which may not necessarily reflect reality (Roth, Ogrin, & Schmitz, 2016). In addition, the sample for this research was made up of faculty who had been identified by colleagues as individuals involved with OER or OP, faculty who could provide information-rich data. This research used a purposive sampling approach, one without an underlying probability-based selection method, which, therefore, limited generalizability, while at the same time providing unique and rich information of value to the study (Etikan, Musa, & Alkassim, 2015). Finally, it must be acknowledged that volunteer bias may be evident in this research: those interviewed were volunteers who had indicated a willingness to be interviewed when responding to the survey. Full-time instructors or faculty were sought for this research. These individuals might be different in some systematic way from others who did not volunteer.

Conclusion & Future Research

This study employed an explanatory sequential mixed methods approach, drawing upon survey and interview data from instructors and faculty, who are using OER or OP, in order to fill a gap in the literature and potentially provide a deeper understanding of the context for adopting OER and implementing OP. Findings have provided information for institutional policy and program development in support of OER and OP implementation.

One factor that motivates the use of OER stands out above all others in this research: faculty and instructors are motivated by the desire for their students to succeed. One faculty member shared, "If we're serious about student success, and we're very serious about increasing inclusivity and access for our students, we can't be relying on things like financial aid, because that's a terri-

ble, terrible misnomer. We need to be very careful about how much we're asking them to pay for things, and whether we can give them open resources." Another factor sheds an interesting light on the impact of using OER. Many interviewees, who started out exploring the use of OER to specifically help their students, now report wanting to share their OER beyond their students, by providing their material to a larger audience. What may start out as a small step can expand into a global leap.

Participants reported that their plans included creating more open material, both on their own and in collaboration, with a few expanding to experiment with OP. Many reported wanting to convert all of their courses to use OER. Some are inspired to conduct research around OER and OP, and numerous responses indicated a desire to reach out to colleagues to encourage these open practices.

Future research could include additional studies employing a technology acceptance model or perhaps other adoption models to frame the study of OER and OP application. It would also be informative to compare adoption rates and practices in areas with statewide initiatives with adoption rates and practices in those states where no such programmatic approach is in place. An in-depth focus on very specific technology needs for adopting, creating, and implementing OER could also benefit institutions developing an institutional OER initiative. Finally, using an OER-enabled pedagogical approach to instruction is in a nascent state, and on-the-ground and in-depth research, from both faculty and student perspectives, is needed to more fully explore the potential of this pedagogical shift. As Wiley and Hilton (2018) have indicated, "As faculty come to understand that OER allows for the benefits of open pedagogy, the adoption of OER will significantly accelerate," (p. 144) which, in turn, will impact education for learners everywhere.

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Appendix A

Online Survey

Aloha! My name is Beth Tillinghast, and I am inviting you to take part in a research study. I am a PhD student at the University of Hawai'i at Mānoa (UHM) in the Learning Design and Technology Department as well as a UHM Librarian working in the area of Scholarly Communication. As part of the requirements for earning my graduate degree, I am conducting research in the area of Open Educational Resources (OER).

What am I being asked to do? If you agree to participate in this project, you will be asked to fill out an online survey.

Taking part in this study is your choice. Your participation in this project is completely voluntary. You may stop participating at any time. If you stop being in the study, there will be no penalty or loss to you. Your choice to participate or not to participate will not affect you.

Why is this study being done? The purpose of this project is to understand the various factors that have motivated faculty to adopt OER and possibly to apply OER-Enabled Pedagogy in their instruction. A number of studies have been conducted of faculty who might be thinking about adopting OER, but very little research has been conducted in regard to faculty who have actually already adopted OER and who are using it in their instruction. I am asking you to participate because you have been identified by one of your colleagues at your institution as someone who has adopted and is using OER.

What will happen if I decide to take part in this study? The survey will consist of around 30 multiple choice and open-ended questions. It will take approximately 15 minutes to complete. The survey questions will include questions like, "What type of OER have you used in your classes?" or "Have you applied Open Pedagogy in your classes?" The survey is connected to this consent form. By reading this form and moving on to the survey portion, you are acknowledging consent to participate.

What are the risks and benefits of taking part in this study? I believe there is little risk to you for participating in this research project. You may become stressed or uncomfortable answering any of the survey questions. If you do become stressed or uncomfortable, you can skip the question or take a break. You can also stop taking the survey, or you can withdraw from the project altogether.

There will be no direct benefit to you for participating in this survey. The results of this project may help to inform and possible promote further OER and OP development.

Confidentiality and Privacy: You will not have to provide any personal information, such as your name or email address. You will be invited, but not required, to contact me through my email address provided at the end of the survey if you would like to be contacted for a follow-up interview as part of the research project.

I will keep all study data secure in a locked filing cabinet in a locked office/encrypted on a password protected computer. Only my University of Hawai'i advisor and I will have access to the information. Other agencies that have legal permission have the right to review research records. The University of Hawai'i Human Studies Program has the right to review research records for this study.

Compensation: There will be no direct compensation for participation in this survey research.

Future Research Studies: Identifiers will be removed from your identifiable private information and after removal of identifiers, the data may be used for future research studies or distributed to another investigator for future research studies. We will not seek further approval from you for these future studies.

Questions: If you have any questions about this study, email me at [betht@hawaii.edu]. You may also contact my faculty advisor, Dr. Christine Sorensen, at [sorens@hawaii.edu]. You may contact the UH Human Studies Program at 808.956.5007 or uhirb@hawaii.edu to discuss problems, concerns and questions, obtain information, or offer input with an informed individual who is unaffiliated with the specific research protocol. Please visit http://go.hawaii.edu/jRd for more information on your rights as a research participant.

To Access the Survey: Please continue using the *Next* button below. By continuing, you are giving consent to participate in this study.

Please print or save a copy of this page for your reference.

Mahalo!

Please tell me a little about yourself by answering the following questions.

1. At what institution do you mainly work?

2. How many years have you been teaching?

- ○ Less than 1 (1)
- ○ 1 to 3 (2)
- ○ 4 to 6 (3)
- ○ 7 to 9 (4)
- ○ 10 to 15 (5)
- ○ 16 to 20 (6)
- ○ More than 20 (7)

3.How many years have you been teaching using OER?

- ○ Less than 1 (1)
- ○ 1 to 3 (2)
- ○ 4 to 6 (3)
- ○ 7 to 9 (4)
- ○ More than 9

4. How many years have you been teaching using OER-Enabled Pedagogy?

- ○ Less than 1 (1)
- ○ 1 to 3 (2)
- ○ 4 to 6 (3)
- ○ 7 to 9 (4)

- ○ More than 9
- ○ N/A

5. What is your tenure status?

- ○ Tenured (1)
- ○ Tenure track, not tenured (2)
- ○ Not tenure track (3)

6. What is your age?

- ○ Under 35 (1)
- ○ 35 - 44 (2)
- ○ 45 - 54 (3)
- ○ 55 + (4)

7. What is your current status?

- ○ Full-time faculty (1)
- ○ Part-time faculty (2)
- ○ Adjunct instructor (3)
- ○ Other (4)

8. What level of courses do you teach?

- ○ Undergraduate (1)
- ○ Graduate (2)
- ○ Both undergraduate and graduate (3)

Please select the most appropriate response to the following statements.

9. Using Open Educational Resources (OER) have benefited me in my instruction.

- ○ Strongly agree (1)
- ○ Agree (2)
- ○ Somewhat agree (3)
- ○ Neither agree nor disagree (4)
- ○ Somewhat disagree (5)
- ○ Disagree (6)
- ○ Strongly disagree (7)

10. Using OER in my classes has increased the learning outcomes of my students.

- ○ Strongly agree (1)
- ○ Agree (2)
- ○ Somewhat agree (3)
- ○ Neither agree nor disagree (4)
- ○ Somewhat disagree (5)
- ○ Disagree (6)
- ○ Strongly disagree (7)

11. I believe that my academic reputation has been enhanced because I am using OER.

- ○ Strongly agree (1)
- ○ Agree (2)

- ○ Somewhat agree (3)
- ○ Neither agree nor disagree (4)
- ○ Somewhat disagree (5)
- ○ Disagree (6)
- ○ Strongly disagree (7)

12. Using OER has been advantageous in the promotion and tenure process.

- ○ Strongly agree (1)
- ○ Agree (2)
- ○ Somewhat agree (3)
- ○ Neither agree nor disagree (4)
- ○ Somewhat disagree (5)
- ○ Disagree (6)
- ○ Strongly disagree (7)

13. Which approach, repository, or software have you used to provide OER for your students? (Please select all that apply.)

- ○ Added OER materials to the Learning Management System (1)
- ○ Pressbooks (2)
- ○ OpenStax (3)
- ○ Open Textbook Network (4)
- ○ MERLOT (5)
- ○ Created my own OER (6)

○ Other (7) _____

14. What type of OER have you used in your classes? (Please select all that apply.)

○ OER textbooks that I have downloaded from a site like OpenStax or Open Textbook Network (1)

○ Scholarly articles that have been published in Open Access journals (2)

○ Materials that I find freely on the Internet (3)

○ YouTube Videos (4)

○ Materials that I have created (5)

○ Materials from open courseware sites (6)

○ Other (7) _____

15. It has been easy for me to find appropriate OER material for my classes.

○ Strongly agree (1)

○ Agree (2)

○ Somewhat agree (3)

○ Neither agree nor disagree (4)

○ Somewhat disagree (5)

○ Disagree (6)

○ Strongly disagree (7)

16. It has been easy for me to adapt the OER material that I have used for my classes.

○ Strongly agree (1)

- ○ Agree (2)
- ○ Somewhat agree (3)
- ○ Neither agree nor disagree (4)
- ○ Somewhat disagree (5)
- ○ Disagree (6)
- ○ Strongly disagree (7)

17. It has been easy for me to integrate OER into my classes.

- ○ Strongly agree (1)
- ○ Agree (2)
- ○ Somewhat agree (3)
- ○ Neither agree nor disagree (4)
- ○ Somewhat disagree (5)
- ○ Disagree (6)
- ○ Strongly disagree (7)

18. I began using OER in my classes because others around me were using OER.

- ○ Strongly agree (1)
- ○ Agree (2)
- ○ Somewhat agree (3)
- ○ Neither agree nor disagree (4)
- ○ Somewhat disagree (5)
- ○ Disagree (6)

- ○ Strongly disagree (7)

19. My department considers it important that faculty use OER.

- ○ Strongly agree (1)
- ○ Agree (2)
- ○ Somewhat agree (3)
- ○ Neither agree nor disagree (4)
- ○ Somewhat disagree (5)
- ○ Disagree (6)
- ○ Strongly disagree (7)

20. Students taking classes in my department expect faculty to use OER in those classes.

- ○ Strongly agree (1)
- ○ Agree (2)
- ○ Somewhat agree (3)
- ○ Neither agree nor disagree (4)
- ○ Somewhat disagree (5)
- ○ Disagree (6)
- ○ Strongly disagree (7)

21. My institution has looked favorably on me because I adopted OER.

- ○ Strongly agree (1)
- ○ Agree (2)

- ○ Somewhat agree (3)
- ○ Neither agree nor disagree (4)
- ○ Somewhat disagree (5)
- ○ Disagree (6)
- ○ Strongly disagree (7)

22. When I began using OER in my teaching, guidance was available on my campus to provide assistance.

- ○ Strongly agree (1)
- ○ Agree (2)
- ○ Somewhat agree (3)
- ○ Neither agree nor disagree (4)
- ○ Somewhat disagree (5)
- ○ Disagree (6)
- ○ Strongly disagree (7)

23. The necessary resources were available to me to help me find, adapt, and integrate OER into my instruction.

- ○ Strongly agree (1)
- ○ Agree (2)
- ○ Somewhat agree (3)
- ○ Neither agree nor disagree (4)
- ○ Somewhat disagree (5)
- ○ Disagree (6)

- ○ Strongly disagree (7)

24. Using OER is congruent with the way I like to conduct instruction.

- ○ Strongly agree (1)
- ○ Agree (2)
- ○ Somewhat agree (3)
- ○ Neither agree nor disagree (4)
- ○ Somewhat disagree (5)
- ○ Disagree (6)
- ○ Strongly disagree (7)

25. Sharing the OER that I might create or modify with others is important.

- ○ Strongly agree (1)
- ○ Agree (2)
- ○ Somewhat agree (3)
- ○ Neither agree nor disagree (4)
- ○ Somewhat disagree (5)
- ○ Disagree (6)
- ○ Strongly disagree (7)

26. Researching and/or developing OER allows me to pursue my research interests or activities.

- ○ Strongly agree (1)
- ○ Agree (2)

- ○ Somewhat agree (3)
- ○ Neither agree nor disagree (4)
- ○ Somewhat disagree (5)
- ○ Disagree (6)
- ○ Strongly disagree (7)

27. I expect that other faculty who develop OER would share their work.

- ○ Strongly agree (1)
- ○ Agree (2)
- ○ Somewhat agree (3)
- ○ Neither agree nor disagree (4)
- ○ Somewhat disagree (5)
- ○ Disagree (6)
- ○ Strongly disagree (7)

28. When I first began using OER, I had the technical skills necessary to adopt the resources.

- ○ Strongly agree (1)
- ○ Agree (2)
- ○ Somewhat agree (3)
- ○ Neither agree nor disagree (4)
- ○ Somewhat disagree (5)
- ○ Disagree (6)

- ○ Strongly disagree (7)

29. I feel I have the technical skills needed to develop or modify OER resources.

- ○ Strongly agree (1)
- ○ Agree (2)
- ○ Somewhat agree (3)
- ○ Neither agree nor disagree (4)
- ○ Somewhat disagree (5)
- ○ Disagree (6)
- ○ Strongly disagree (7)

30. I understand the copyright licenses of OER that allow their reuse.

- ○ Strongly agree (1)
- ○ Agree (2)
- ○ Somewhat agree (3)
- ○ Neither agree nor disagree (4)
- ○ Somewhat disagree (5)
- ○ Disagree (6)
- ○ Strongly disagree (7)

31. Are you now or have you applied OER-Enabled Pedagogy in your classes? (This approach might be exemplified by the involvement of the students in curriculum or resource development.)

- ○ Yes (1)
- ○ No (2)

Skip To: Q33 In a few words, … = No

32. If you have applied OER-Enabled Pedagogy, would you please describe the activity in a few words.

33. What motivated you to try OER-Enabled Pedagogy in your classes?

34. How has the use of OER-Enabled Pedagogy affected student behavior or learning?

35. In a few words, please share what makes OER valuable to you in your teaching?

36. Finally, please sum up the reasons that you were motivated to adopt or develop OER.

End of Block: Default Question Block

Thank you very much for taking this survey. I would very much appreciate it if you would consider participating in an interview on this same topic. It would support my dissertation research and further scholarly work in OER and OER-Enabled Pedagogy.

If you would like to participate in this continued research project, please contact me at betht@hawaii.edu.

Once again, thank you very much for your participation.

Mahalo!

A

Appendix B
Interview Protocol

Faculty Interview

Interviewer: BT
Interviewee: F#
Date of Interview:
Start Time of Interview:
End Time of Interview:
Location of Interview:

A. Introduction

As faculty identified for this research, you have been involved with some aspect of the adoption or creation of OER. Because of this experience, your opinion and perspective represent valuable information that might potentially impact further OER or OER-Enabled Pedagogical development.

Thank you very much for agreeing to participate in this interview.

B. Interviewee Background – Warmup Questions

1. Before we begin talking about textbooks, please tell me a little about yourself. How long have you worked at __(Name of Institution) _____?

2. What's your discipline?

C. Review of Study

The purpose of this study is to gain an understanding of the factors that have motivated faculty to adopt or create OER. If faculty are also experimenting with or implementing OER-Enabled Pedagogy, I would like to hear about the reasons for doing so.

As you know when you signed the consent form, I will be audio taping our conversations today.

Do you have questions before we begin?

→Record Time Start _____

→Start Recording

D. Interview Questions for Faculty

1. Please describe how you have used OER in your instruction.

2. Would you please describe the ways that using OER benefit or detract from your instruction.

3. What about for your students? Describe the ways that the use of OER in your instruction might either benefit or detract from your student's learning.

4. Would you please discuss ways that you may have personally or professionally gained by using OER?

5. What about gains for your department or institution? Would you describe those.

6. Please tell me about how you transitioned from using commercial materials to using OER in your classes.

7. Tell me about your experience in terms of the effort it has taken to find, and adapt, and then integrate OER into your classes.

8. What were the influences in your personal or professional life that caused you to adopt OER?

9. How have you felt your reputation on campus has been affected by your use of OER in your classes?

10. How did your institution support your initial use of OER?

11. How does the use of OER reflect your instructional philosophy?

12. If applicable, would you please describe the professional and personal satisfaction that you derive when adopting or creating OER.

13. Would you describe any advantages that using OER might have in the promotion and tenure process.

14. Would you please tell me your thoughts on the positive and/or negative aspects of sharing these resources.

15. In what way do you think your skills with technology have played part in adopting OER?

16. Would you describe your knowledge of the open licenses that support OER.

17. How have you experimented with OER-Enabled Pedagogy in your classes? (If No, ask "Why have you decided not to explore OER-Enabled Pedagogy? and conclude interview.)

18. Would you please tell me about your experiences applying OER-

Enabled Pedagogy in your classes.

19. What motivated you to try this approach?

20. In what ways has the use of OER-Enabled Pedagogy impacted your instruction?

21. From your experience, please describe the benefits and drawbacks of OER-Enabled Pedagogy on students' learning.

    Please describe the process and the effort in applying OER-Enabled Pedagogy in your teaching.

22. Would you please tell me about both the personal and professional reasons that influenced you to adopt OER-Enabled Pedagogy.

23. In what ways did your department or institution support your use of OER-Enabled Pedagogy?

24. Would you talk about possible personal and/or professional satisfaction in using OER-Enabled Pedagogy.

25. How might your technology skills have played a role in the application of OER-Enabled Pedagogy in your teaching?

26. Finally what makes OER valuable to you and to your students?

27. What are your future plans in terms of using OER or OER-Enabled Pedagogy?

E. Concluding Questions for Faculty

28. Is there anything else you would like to share about your experiences with adopting OER textbooks or materials or about using an OER-Enabled Pedagogy approach?

→Stop Recording

→Record Time End _____

I think that is all then, and I want to thank you very much for taking time for this interview today. You have been very helpful, and know that the information you provided has been important.

Other Topics Discussed:
Post Interview Comments and/or Observations:

•Make note of comments or observations here.

Student and Faculty Perceptions of Quality and Utilization of Open Educational Resources in a Psychology Course

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Abstract

A survey was conducted to research student and faculty perceptions of the quality and utilization of the Open Educational Resources used in the PSY 110HA class taught at the Saint Leo University continuing education centers. Most students indicated that having the textbook content fully online helped them in completing assignments on time, and most indicated that it was easy to access the content online. Most students reported that they would like to take another course that had all of the textbook material online; however, nearly one third of the students indicated that they would prefer to have taken this class with a paper textbook that they could purchase. The professors did not think that the OER helped these students in completing assignments on time, nor did the professors feel that the OER contributed to these students being better prepared for class. The professors also reported that some students said that they had technical difficulties in accessing the OER. Overall the professors were satisfied with the OER that were used as the textbooks for this course.

Keywords: Online Educational Resources, OER, etextbooks, electronic textbooks, commercial textbooks, psychology textbooks, faculty perceptions, student perceptions

Percepciones de la calidad y utilización de los recursos educativos abiertos en un curso de psicología

Resumen

Se realizó una encuesta para investigar las percepciones de estudiantes y profesores sobre la calidad y utilización de los recursos educativos abiertos utilizados en la clase PSY 110HA que se imparte en los centros de educación continua de la Universidad de Saint

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Leo. La mayoría de los estudiantes indicaron que tener el contenido del libro de texto completamente en línea les ayudó a completar las tareas a tiempo, y la mayoría indicó que era fácil acceder al contenido en línea. La mayoría de los estudiantes informaron que les gustaría tomar otro curso que tuviera todo el material de los libros de texto en línea; sin embargo, casi un tercio de los estudiantes indicaron que preferirían haber tomado esta clase con un libro de texto en papel que tenían que comprar. Los profesores no pensaron que los REA ayudaron a estos estudiantes a completar las tareas a tiempo, ni los profesores sintieron que los REA contribuyeron a que estos estudiantes estuvieran mejor preparados para la clase. Los profesores también informaron que algunos estudiantes dijeron que tenían dificultades técnicas para acceder a los REA. En general, los profesores se mostraron satisfechos con los REA que se utilizaron como libros de texto para este curso.

Palabras clave: REA, libros de texto de psicología

一门心理课中开放教育资源的质量和使用情况感知

摘要

执行了一项调查，研究圣里奥大学继续教育中心PSY 110HA课堂中学生和教师对开放教育资源（OER）的质量和使用情况的感知。大多数学生表示，完全使用网络课本内容帮助其按时完成作业，并且获取网络内容并不困难。大多数学生报告称，他们愿意参与另一门完全使用网络课本材料的课程；不过，近三分之一的学生认为，他们更愿意参加使用纸质课本的课程，尽管他们不得不购买课本。教授们认为OERs并没有帮助学生按时完成作业，他们也不觉得OERs帮助学生为课堂作更好的准备。教授们还报告称，一些学生表示他们在获取OERs一事中曾遭遇技术问题。整体而言，教授们对OERs作为这门课的课本一事感到满意。

关键词：开放教育资源（OERs）, 心理学课本

Introduction

Over the past ten years open educational resources (OER) have been used in several Saint Leo University courses replacing commercial textbooks. Students and professors may access the open electronic course content linked in the syllabus contained in the learning management system. This study examines if continuing education center students, taking the course PSY 110HA – Psychological Well-Being, felt they were able to access the material, utilize it, and complete assignments on time. The study also asked professors if they thought students were able to complete assignments on time, and if having OER helped students be better prepared in comparison to classes that they had taught with a commercial textbook. Additional questions were posed to professors about the quality of the electronic content and the usability of the OER.

Purpose of the Present Study

The purpose of the study was to find out if students liked utilizing the OER as much as they had liked utilizing commercial textbooks, if they would want to use more OER in the future, and if faculty perceived the OER as a good textbook source. The author of the study surmised that the continuing education center students would not like using the OER, and would not want to use OER in the future because of numerous comments made by the continuing education center students over the years to the author about utilizing online content and the preference for print sources. This is significant in that most of the Saint Leo University library holdings are online and not held in paper format. Students are required to utilize the university online library materials, including eBooks and a psychology database, as part of this course. Students must be able and willing to utilize the OER to complete the course too.

The Appeal of OER - Monetary Value

Even though open online textbook content is relatively new in comparison to the paid print format, much has been researched and written about open electronic resources used as textbooks. Studies show the advantages to the cost-savings in replacing a traditional paper textbook with OER (Bliss et al., 2013a; Ikahihifo et al., 2017). This savings lets students pay for other expenses and even continue their education without the burden of the cost of high-priced textbooks (Ikahihifo et al., 2017).

The Appeal of OER - Enhanced Learning Tools

The electronic format allows for enhanced audio and visual teaching tools to be embedded into the electronic course reading, such as videos and graphics, which students report aid in understanding the content (Bliss et al., 2013b; Cooney, 2017). Lindshield and Adhikari note that in addition to OER videos and graphics, students appreciate embedded web links and searching features within the electronic "flexbook"

(2013). Cooney found that "all students who were interviewed mentioned their satisfaction with, and preference for having all the course materials in one place" when elaborating on the experiences using OER (2017).

The Appeal of OER - Quality

Comparison studies of the content quality of OER versus commercial textbooks show that many students and faculty perceive the OER to be of equal or better quality when compared to commercial textbooks (Bliss et al., 2013b; Watson et al., 2017; Jaggars et al., 2017; Cooney, 2017; Piña & Moran, 2018).

The Appeal of OER - Grades

Studies have also shown that grades earned by students utilizing OER are similar or better than the grades of students who used commercial textbooks. Two terms after incorporating OER into select classes, Winitzky-Stephens & Pickavance noticed that grades, earned by students using OER, were higher than the grades earned by students using the commercial textbook in other sections of the course during the same time period (2017). In a similar study, Colvard et al. also found that grades were higher in the OER sections when compared to the other sections of the course taught with a commercial textbook (2018). In a single course of college algebra taught with a commercial textbook, then taught with OER for one term, then taught with a commercial textbook the next term after the OER, Chiorescu discovered that students' grades were higher the term that the OER was used (2017). In an introductory sociology course, Medley-Rath found that students, taking her class online with OER and students taking that same class with her in one section face to face with a commercial textbook during the same time period, did not have significant differences in grades earned (2018). Rockinson-Szapkiw et al. reported that grades, earned by students using OER, were similar to grades of their classmates who opted to use commercial textbooks enrolled in the same courses in the same time period (2012). Hilton and Laman were able to show that "students who used the open textbooks in the fall of 2011 had better overall outcomes than those who used traditional textbooks in spring of 2011" (2012).

The Appeal of OER - Perception & Attitude

Perception and attitude seem to play a role in successful utilization of OER. Rockinson-Szapkiw et al. discovered that "students who chose e-textbooks for their education courses had significantly higher perceived affective learning and psychomotor learning than students who chose to use traditional print textbooks" (2012). Afolabi found that when students have a "positive perception of OER", they "performed very well in the achievement test administered" (2017).

Preference for Paper

So, with all of the favorable aspects of OER, would students prefer to continue using OER? Medley-Rath discovered

that despite all of the benefits reported, students still preferred the commercial (paper) format (2018). Ikahihifo et al. also found that some of their student survey respondents preferred the commercial textbook over the open electronic texts (2017). In a study conducted by Watson et al., one student indicated a preference for commercial (paper) textbooks because it was not possible to "physically highlight and make notes directly on the page" of OER, and because utilizing electronic texts caused "eyestrain" (2017). Cooney found that students who utilized OER had printed pages out of it so that they could "take notes on the page" or simply because they had a "preference for paper" (2017).

Electronic Challenges

Besides the lingering preference for paper, some students reported shortcomings when utilizing the electronic format. Two separate studies in two different states showed that students encountered similar challenges with OER. Kinskey et al. (2018) in Minnesota and Ikahihifo et al. (2017) in Virginia reported that students surveyed told that accessing the internet, reading online, and scrolling online vs. flipping paper pages, was difficult for them. Additionally, the students in Minnesota stated that there were "broken web links and information that was inaccurate in the OER textbook about a subject with which they were familiar" (2018). In contrast, Hilton and Laman reported that in regards to utilizing OER, "42% said that it was easy, 28% said that it was moderately easy, 24% said that it was neither hard nor easy, and 8% said that it was moderately difficult" (2012). No student thought that it was significantly difficult to use (2012).

Method

So, would Saint Leo University continuing education center students appreciate using OER? Four OER are used for this course including the Open Stax Psychology OER. Positive psychology in a nutshell by Ilona Boniwell and Social psychology by John DeLamater are two eBooks from the Saint Leo Cannon Memorial Library catalog, accessible with a student login, used in this course. The seven challenges workbook: Cooperative communication skills for success at home and at work, published by The New Conversations Initiative, available as OER, was also used. A student survey (see Appendix A) was constructed to ascertain reception and utilization of the OER in PSY 110 HA (Psychological Well-Being) taught at the regional education centers. A separate faculty survey (see Appendix B) was administered to gauge faculty perception of the utilization of the OER. The author asked permission from each professor to distribute the survey to their class. Professors were also asked to take the faculty survey.

Testing

Students taking and faculty teaching the PSY 110HA course at Saint Leo University education centers were asked to complete the surveys vol-

untarily during the 2018-2019 school year. Since class sizes were small and the course was not offered every term, an extension from the university IRB was requested and granted to gather more responses through September 2020. No incentive was provided, and all responses were kept anonymous.

Results

Fifty-three student responses were gathered. Most students, forty-five (84.9%) indicated that when compared with a course that has a commercial textbook, having the textbook content fully online helped them in completing assignments on time. Seven students (13.2%) did not think that the OER aided in completing assignments on time, and one student did not answer. When asked if it was easy to access the online content, thirty-four (64.1%) said yes, sixteen (30.18%) stated somewhat, and three (5.66%) said no. When asked if they would want to take another class that had all of the textbook material online forty-six (86.7%) said yes and seven (13.2%) said no. Students were asked if they would prefer to have taken the class with a paper textbook that they had to purchase. Seventeen (32.07%) said yes and thirty-six (67.9%) said no. All but one student indicated that they had home internet access and cell phone internet access. When asked if they utilized a Saint Leo Center computer lab to access the textbook content for the course, seventeen (32.07%) stated yes, and thirty-six (67.9%) said no.

Six Professors agreed to take the survey designed for them. They were asked if they felt having OER improved student ability to complete assignments that involved utilization of the texts when compared to classes that they have taught from a commercial textbook in the past. Four (66.6%) of the respondents said no and two (33.3%) said yes. Professors were also asked if they felt their students were better prepared for class discussions on assigned readings when compared to classes that they have taught from a commercial textbook in the past. Five (83.3%) professors indicated that it was about the same and one (16.6%) professor said no. When asked if any student had related to the professor that they had no internet access, two professors (33.3%) said yes and four (66.6%) professors said no. It should be noted, though, that all Saint Leo centers contain computers for students to use and/or a computer lab, as well as wireless internet access for students to utilize. This information is made known to students at their orientations and posted at the centers. Professors were asked if any student reported that they had any technical difficulties while accessing the OER. Three (50%) professors said yes and three (50%) said no. The ones who indicated that there was a problem stated, "they couldn't get to the textbook at all", "some were unable to locate them [the OER] even though we had gone over this in class", and "content would not open". When asked if they felt it was easy to access the OER, three (50%) professors said yes and three (50%) said somewhat. All (100%) of the professors felt that the OER content was comprehensive in scope of the subject of psy-

chological well-being. All professors thought that the OER were well written, and that the content was arranged in a logical way for student understanding of the subject. Overall, five (83.3%) professors indicated that they were satisfied and one (16.6%) professor said that they were somewhat satisfied with the OER.

Discussion

With the majority of the student respondents (86.7%) indicating that they would want to take another course with an OER; and with the majority (84.9%) stating that having an OER aided in completing assignments on time when compared to a class with a paper textbook, it would seem that most students liked using OER without any reservations. Since seventeen (32.07%) students indicated that they would be willing to pay for a paper textbook for this course, it gives some pause to the complete acceptance and liking of OER. Unfortunately, no follow-up question was included in this survey to discover the reason or reasons why so many would prefer that option. Perhaps an open-ended question would have shed light on this. Even though the professors did not see a significant difference in the preparedness for class and completion of assignments from students, professors were impressed by the quality of the collection of OER for this course.

Limitations

This study was limited by the number of responses received. Participation was voluntary, and no incentive was given. Only faculty currently teaching the course and students currently enrolled in the course were allowed to take the survey. Students who had taken the course in the past were not surveyed.

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Appendix A

Student Survey

1. When compared with a course that has a traditional paper textbook, did having the textbook content online for this course help you complete your assigned readings on time?

Yes_____ OR No_____

2. Was it easy to access the online textbooks to finish your assignments?
Yes_____ Somewhat_____ No_____

3. If you answered "no" to #3, what would have made it easier to access?_____

4. Would you want to take another class that had all of the textbook material online? Yes_____ OR No_____

5. Would you prefer to have taken this class with a paper textbook that you purchase? Yes_____ OR No_____

6. Do you have home internet access? Yes_____ OR No_____

7. Do you have cell phone internet access? Yes_____ OR No_____

8. Did you utilize a Saint Leo Center Computer or Computer Lab to access the textbook content for this course?

Yes_____ OR No_____

Appendix B

Professor Survey

1. When compared to classes, where you have taught from a traditional paper textbook, and the purely online textbook content available for this course: Do you feel that having the textbook content already online improved student ability to complete assignments that involved utilization of the texts?

Yes_____ About the Same_____ No_____

2. When compared to classes, where you have taught from a traditional paper textbook, and the purely online textbook content available for this course: Were students better prepared for class discussions on assigned readings each week in this course?

Yes_____ About the Same_____ No_____

3. Did any student relay to you that they had no access to the internet? Yes_____ OR No_____

4. Did any student relay to you that they had any other technical difficulties accessing the online texts? Yes_____ OR No_____

5. If you answered "yes" to #4, what were the technical difficulties they encountered?_____

6. Do you feel it is easy to access the online textbook content? Yes_____ Somewhat_____ No_____

7. Do you feel that the online textbook content was comprehensive in the scope of the subject? Yes_____ Somewhat_____ No_____

8. Do you feel that the online textbook content was written well?

Yes_____ Somewhat_____ No_____

9. Do you feel that the online textbook content presented was arranged in a logical way for student understanding of the subject? Yes_____ OR No_____

10. Overall, what is your satisfaction with the online textbook content? Very Satisfied_____ Satisfied_____ Somewhat dissatisfied_____ Very Dissatisfied_____

Adoption and Adaptation of Open Educational Resources: Models of Decision-Making and Action Planning

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Abstract

Open educational resources (OER) make educational resources widely available to all students and educators for free. However, OER are still untried by the majority of instructors in higher education. In higher education, an adoption of OER usually involves adaptation activities to make the adopted OER useable in the specific teaching context. This paper applies multiple criteria decision-making (MCDM) approaches to OER adoption and adaptation, and proposes a two-procedure framework of OER adoption decision-making and OER adaptation action planning that can be used to guide OER adoption. The OER adoption decision-making procedure supports OER adoption decision making by using a decision matrix for evaluation of the OER product based on the OER profile and the usability. The adaptation action planning procedure supports the OER adaptation process through generating a plan of OER adaptation for a successful adoption. A case study is used to explain the usefulness of the OER adoption and adaptation framework in higher education.

Keywords: Open educational resources (OER), multiple criteria decision-making (MCDM), adoption of OER, adaptation of OER, higher education, decision matrix, actions matrix

Adopción y adaptación de recursos educativos abiertos: Modelos de toma de decisiones y planificación de acciones

Resumen

Los recursos educativos abiertos (REA) hacen que los recursos educativos estén ampliamente disponibles para todos los estudiantes y educadores de forma gratuita. Sin embargo, la mayoría de los profesores de educación superior aún no han probado los REA.

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En la educación superior, la adopción de REA generalmente implica actividades de adaptación para hacer que los REA adoptados sean utilizables en el contexto de enseñanza específico. Este documento aplica enfoques de toma de decisiones de múltiples criterios (MCDM) para la adopción y adaptación de REA, y propone un marco de dos procedimientos para la toma de decisiones de adopción de REA y la planificación de acciones de adaptación de REA que se puede utilizar para guiar las adopciones de REA. El procedimiento de toma de decisiones de adopción de REA respalda la toma de decisiones de adopción de REA mediante el uso de una matriz de decisiones para la evaluación del producto de REA basada en el perfil de REA y la usabilidad. El procedimiento de planificación de la acción de adaptación apoya el proceso de adaptación de REA mediante la generación de un plan de adaptación de REA para una adopción exitosa. Se utiliza un estudio de caso para explicar la utilidad del marco de adopción y adaptación de REA en la educación superior.

Palabras clave: Recursos educativos abiertos (REA), toma de decisiones con múltiples criterios (MCDM), adopción de REA, adaptación de REA, educación superior, matriz de decisión, matriz de acciones

开放教育资源的采纳和改编：决策和行动规划模型

摘要

开放教育资源（OER）将教育资源以免费的形式广泛提供给所有学生和教育者。不过，高等教育中绝大多数教师仍然未尝试过OER。采纳OER通常涉及一系列内容改编，以期让改编后的OER在特定教学情境下具有可用性。本文对OER的采纳和改编使用多准则决策法（MCDM），并提出一个包含两个步骤（即OER采纳决策和OER改编行动规划）的框架，该框架能被用于指导OER采纳。在OER采纳决策步骤中，基于OER的信息描述和可用性，使用决策矩阵评价OER产品，进而支持OER采纳决策。在OER改编行动规划步骤中，通过创造能被成功采纳的OER改编计划，进而支持OER改编过程。使用了一项案例研究解释OER采纳和改编框架在高等教育中的有用性。

关键词：开放教育资源（OER），多准则决策（MCDM），OER采纳，OER改编，高等教育，决策矩阵，行动矩阵

Introduction

Open educational resources (OER) (OER Commons, 2020; MIT OpenCourseWare, 2020) represent an innovative movement in education and are growing in awareness and use during the past decade. OER can make educational resources widely available to all students and educators for free. However, OER have not been significantly adopted in the higher education sector (Kortemeyer, 2013; Allen & Seaman, 2014; Wang, 2018).

OER include diversified forms of educational materials such as books, audio and visual artifacts, lecture series, and articles. Originally, OER aim to reduce prices of textbooks in higher education (Hilton & Wiley, 2011). After years of OER development, the financial sustainability of OER in higher education remains under debate (Downes, 2011; Joyner, 2013; Annand, 2015). To address the problem of OER sustainability, research papers have proposed business models for OER (e.g., Downes, 2007; de Langen, 2013). In fact, the business models of effective financially sustainable OER in higher education involve many stakeholders at several levels of society, education institutions, the OER community, and individual faculty members. Sustainable OER can be achieved only when OER create, deliver, and capture measurable values for students, education institutions, OER developers, and the entire society (Wang, 2019).

Challenges for OER in the higher education sector are more significant than those in the K-12 education or community college sectors. Higher education concentrates on specialization of diversified disciplines, and promotes research and academic freedom. In addition, there are few consistent codes of ethics related to the issues of textbooks in higher education (Robie et al., 2003). Nevertheless, while the financial sustainability of OER in higher education remains to be seen, OER researchers in higher education (Colvard et al., 2018) have claimed that OER do much more than simply save students money and address student debt concerns, and can improve end-of-course grades at significant rates. Undoubtedly, if OER have about the same quality and about the same adoption process as commercialized educational resources, there is no reason for instructors not to adopt OER. The reality is that not every discipline in higher education can find OER which can compete with commercialized education resources in all aspects of quality, teaching instruments, and academic services. Accordingly, an adoption of OER usually requires an extensive adaptation process to modify adopted OER or to create supplemental materials based on the specific teaching context. When an academic unit or an individual faculty member chooses to use OER to replace the commercialized educational materials, they must search the target OER, make an adoption decision, generate an adaptation plan, and complete an adaptation process. This paper is to propose an OER adoption decision- making procedure to support OER adoption decisions and an OER adaptation planning procedure to support adaptation actions processes. It

applies a case study to demonstrate the usefulness of the tools.

The rest of this article is organized as follows: a) Issues of OER in Higher Education; b) OER Adoption Decision-Making Procedure; c) OER Adaptation Action Planning Procedure; d) A Case Study of OER Textbook Adoption and Adaptation; e) Discussion and Contribution; and f) Conclusion of the study.

Adoption and Adaptation of Open Educational Resources: Models of Decision-Making and Action Planning

This section discusses the issues of OER in higher education that characterize the weaknesses of current OER and the difficulties faced by OER adopters in higher education.

Limitations of the model of production of OER in higher education

OER are generated by two major sources. One source of OER is sponsorships of governments, charity organizations, and educational institutions. Those OER sponsors provide financial support and hire developers to generate OER. The other source of OER is voluntary teams or individuals who license their own educational materials as OER. Currently, most, if not all, OER are produced by using a stand-alone project approach (Wang & Wang, 2016). A stand-alone project has a start point and a clear finish line. After the finish line, when the project deliverables are delivered, the project sponsorship is terminated and the team is dissolved. This stand-alone model of OER production has limitations because OER are knowledge products and need to be continuously updated or improved. Apparently, as the stand-alone project approach does not support OER updating and improvement, massive OER have quickly become "waste" that are waiting for recycling. Although OER can be modified to reuse by anyone, coordination of piece-meal style updating is difficult in the OER environment. As a result, significant volume of OER in the cloud has been antiquated that in turn, makes search of usable OER difficult. Furthermore, stand-alone projects do not emphasize long-term academic services for the OER. On the competitors' side, commercial publishers have the advantage of editorial staff to make fast revisions (Zinser & Brunswick, 2010), to provide updated materials, as well as value-added services to both instructors and students.

Not many higher education institutions formally recognize faculties' contributions to OER

As a knowledge intensive society, higher education institutions expect faculties to create new knowledge (Mohrman et al., 2008). Accordingly, basic scientific research has been the dominant element in the academic reward systems in higher education (Serow, 2000). Although few higher educational institutions would oppose OER, not many institutions have clear policies

of rewards beyond moral support for OER development or OER adoption. The motivation for faculty members to develop OER or OER adoption without tangible rewards is highly doubtful. A challenge for OER in higher education is to achieve some success in preserving or expanding the place of effective OER development and OER adoption in the reward systems at higher educational institutions.

Lack of practical solutions to sustainable OER in higher education

Autonomy is one of the unique characteristics in higher educational institutions that distinguishes it from other types of organizations (Bentley & Kyvik, 2011). The autonomy in higher education is present at the organizational level (Enders et al., 2013), as well as the individual level (Hoecht, 2006). The autonomy in higher education is meant to protect academic freedom and to promote self-governance within the academic institutions (Kreysing, 2002). On the other hand, OER involve many types of stakeholders (Wang & Wang, 2018), and the OER movement is determined by the diversified social and political factors. Currently, there are few effective practical solutions to wide OER diffusion in the autonomic environment of higher education. Although the OER community continuously seeks effective solutions to sustainable OER, the sustainability of OER without continuous project funding support in higher education has not yet been fully achieved (Wang, 2019). A significant challenge for OER in higher education is to develop a practical framework to achieve sustainable OER in the autonomic environment.

Methodology

Multiple Criteria Decision-Making (MCDM)

OER adoption raises a variety of concerns, including curriculum compliance, worth of invested time and effort, risks of failure, and others. Concerns vary, and depend upon institutional strategies, characteristics of disciplines, career stages of faculty members, and others (Wang, 2021). Faculty's confidence at the planning phase of an OER adoption project is represented in the result of a decision-making process. This section explains how various factors involved in the decision-making process in OER adoption projects, and provides a systematic approach to evaluation of OER adoption projects.

OER adoption and adaptation are multiple criteria decision-making (MCDM) problems (Acuna-Soto, Liern, & Perez-Gladish, 2019). MCDM is a multi-disciplinary methodology for decision-making and scenario planning (Zeleny, 1973; Zionts, 1979; Hwang & Yoon, K. 1981). MCDM supports structuring complex problems through specifying multiple criteria explicitly and leads to more informed and better decisions. There have been a variety of methods and tools in MCDM developed in an array of the contexts of decision-making analysis since the start of

the research subject in the early 1960s. Decision matrix (Shafer, 1976; Yang & Singh, 1994) is a widely-applied MCDM tool. A decision matrix is a list of values in rows and columns that allows an analyst to systematically identify, analyze, and rate the relationships between these values. The elements of a decision matrix include certain decision factors (or decision criteria) and their properties and perceived performance in the decision-making context. The matrix is used to present the decision factors and assessment of each factor's relative significance for a decision-making problem.

OER adoption decision-making

There are two categories of factors that can influence people in OER adoption decision making: OER profile and OER usability for a particular course.

Factors of OER profile:

The profile of an OER product describes the major characteristics of the OER product and provides a general outline of the OER product. A profile of OER product does not portray the quality of contents which depends on specific target course and the adopter's subjective judgement. The major factors of profile of OER product and their definitions are listed below.

- Creator credential: Creator's academic background
- Organization affiliation: Reputation of the "host" organization
- Authenticity: Free of plagiarism or forgery
- Sponsorship: Reputation of the sponsors if any
- Copyright and licenses: Type of Creative Commons Licenses
- Language: The language used
- Currency: Publication date
- Reviews: Peer review records
- Social network: User community
- Accessibility: Accessible to people with disabilities
- Special requirements: Any special equipment other than normal computers is needed.

The factors of OER profile are evaluated by objective facts. Usually, a decision of adoption is based on the facts of whether the OER profile meets certain criteria. For example, an OER product published longer than a decade ago without properly updating is considered obsolete.

Factors of OER usability for the target course:

The usability of an OER product depend upon the context of use for a particular course. In comparison with the factors of OER profile, the factors of OER usability are evaluated by subjective measurements. The major factors of OER usability and their definitions are listed below.

- Alignment to course objectives: Alignment to the target course objectives
- Valid contents: The contents are valid and current, and appropriate for the target audience
- Clarity of presentation: The contents are presented clearly and logically
- Quality of teaching instruments:

The quality of teaching instruments (e.g., PowerPoints slides)

- Quality of teaching manual: The quality of teaching instructions
- Quality of assignment materials: The quality of materials or instructions of assignments (e.g., exercises, projects, lab, survey, etc.) for students
- Quality of assessment instruments: The quality of assessment instruments (e.g., quiz tests, exams, discussion questions, etc.)
- Fitness to the technological environment: The condition of being suitable for the technological platform (e.g., online learning management system).

Each of the OER usability factors may not be equally important to the target course. To incorporate the relative importance of each factor in the evaluation, the weighted average method can be used. This method assigns a relative importance weight (e.g., a 0.1-1 scale) to each usability factor. The adopter then rates the OER product with respect to each usability factor and obtains the rating (e.g., a 0-1 scale) of each of the usability factors. The rating value of each usability factor is multiplied by the corresponding importance weight to calculate a weighted score. These weighted scores are then summed over all the factors to obtain one aggregate weighted score for the OER product. The aggregate weighted score is considered the usability measure of the OER product for the target course. The weighted average method is simple, but has its limitation in that the weights and the ratings of usability factors are subjective.

The decision matrix is a simple instrument for selection of OER products for the target course. A decision matrix is a table of decision factors and values that allows the OER adopters to systematically identify, analyze, and rate the OER profile factors and OER usability factors. In the present case, a decision matrix includes two parts: OER profile evaluation and OER usability evaluation, as shown in Table 1.

OER adaptation action planning

Adoptions of OER can be different from adoptions of commercial educational resources in two aspects. First, currently, few OER products have complete ancillary materials for teaching, such as teaching manuals, test banks, and assignment materials, and adopters of OER need to perform certain "self-services" which would otherwise be provided by commercial publishers (Wang & Wang, 2017). Second, on the positive side, OER can be modified by anyone to meet particular needs in the specific context of course. Thus, a full adoption of OER for a course would include adaptation actions.

An action plan delineates the actions needed to reach a goal. In this study, an OER adaptation action plan guides how the adopted OER can be used for the target course though modification and further development of ancillary teaching materials. Using an action plan matrix, one can list the adaptation actions after the selection of

the OER product, and specify the benefits, potential issues, estimated workload, and suggestions for each action. Table 2 exhibits a template of OER adaptation actions matrix.

Table 1. Decision Matrix of OER Adoption

OER Profile		
Profile Factors	**Property of the OER Product**	**Pass/Failure**
Creator credential		
Organization affiliation		
Authenticity		
Sponsorship		
Copyright and licenses		
Language		
Currency		
Reviews		
Social network		
Accessibility		
Special requirements		

OER Usability		
Usability Factors	**Rating**	**Weight**
Alignment to course objectives		
Valid contents		
Clarity of presentation		
Quality of teaching instruments		
Quality of teaching manual		
Quality of assignment materials		
Quality of assessment instruments		
Fitness to the technological environment		
Total Weighted Average Score		

Table 2. OER Adaptation Actions Matrix

Actions	**Benefits**	**Potential Issues**	**Estimated Workload**	**Suggestions**
Action-1				
Action-2				
.....				

A Case Study of OER Textbook Adoption and Adaptation

The proposed models of decision making and action planning for OER textbook adoption and adaption are pragmatic. While rigorous peer review plus long-term examination is unfilled, a case study seems to be the only feasible tool to validate the proposed models. this section presents a case study of OER textbook adoption and adaptation in higher education, and demonstrates the process of OER adoption decision making and OER adaptation action planning.

The course selected in the case study was the Introduction to Information Systems, a business core course for all undergraduate business majors. The commercial textbook used in this course before the OER adoption costs more than $150 USD. The case study was to answer a general question: what is the process of full-scale adoption of OER for a course by replacing the commercial textbook with an OER textbook?

(1) Preliminary search for OER textbooks for the course to replace the commercial textbook

The first phase of an OER adoption was to search the candidate OER textbooks. Keywords related to the course title were used to search the popular OER web portals as well as the Internet in general. The review work in this case study was not difficult because the number of available OER textbooks for the course is not large, and only three OER textbooks related to this course were found.

(2) Decision of selection of an OER textbook for the course

A selection decision making process was conducted to compare the three alternatives. OER adoption decision matrices were applied to evaluate each of the three alternatives. Only Bourgeois' textbook (2019) passed the OER profile evaluation. The OER usability evaluation was then conducted. The decision matrix for the OER textbook is exhibited in Table 3. As indicated in Table 3, in terms of the topics covered and the contents, this open access textbook was not significantly different from the commercial textbook currently used for the course. Hence, the difference between the OER textbook and the replaced commercial textbook was not considered a factor for the teaching and learning effectiveness of the course.

Ancillary materials of a textbook are important for instructors because they can assist the instructors for preparations and teaching. The OER textbook does not publish with its ancillary teaching materials. However, the website of the OER textbook posted useful teaching instruments for the previous version of the textbook, such as PowerPoint lecture slides and assessment instruments, developed by adopters of this OER textbook in several higher educational institutions. In this example, this OER textbook had above the average usability of OER textbooks in this aspect. Nevertheless, the ancillary materials of this OER textbook

posted on the website or other places were not as complete as that of the replaced commercial textbook. To make the OER textbook more usable for the present course to meet the designed learning objectives, adaptation actions to develop additional ancillary materials for this OER textbook seemed to be necessary.

Table 3. Decision Matrix of OER Adoption in the Case Study

OER Profile		
Profile Factors	**Property of the OER Product**	**Pass/Failure**
Creator credential	The author holds PhD in the academic field	Pass
Organization affiliation	The university is accredited by the WASC Senior College and University Commission (USA)	Pass
Authenticity	The original version was published in 2014 and was licensed under Creative Commons Attribution-NonCommercial 4.0 International License	Pass
Sponsorship	The original 2014 version was funded by the Saylor Foundation	Pass
Copyright and licenses	Licensed under Creative Commons Attribution-NonCommercial 4.0 International License	Pass
Language	English	Pass
Currency	Revised from the 2014 version	Pass
Reviews	The OER textbook website shows numerous users of the textbook. Several scholars in the field have contributed to the revision of the 2014 edition	Pass
Social network	A strong social network https://opentextbook.site/	Pass
Accessibility	PDF and Web versions	Pass
Special requirements	No	Pass
OER Usability		
Usability Factors	**Rating**	**Weight**
Alignment to course objectives	1	1
Valid contents	1	1
Clarity of presentation	1	1
Quality of teaching instruments	1	0.8
Quality of teaching manual	0.1	0.2
Quality of assignment materials	0.5	1
Quality of assessment instruments	0.5	0.5
Fitness to the technological environment	1	0.5
Total Weight Average Score	5.07 (of 6)	

(3) Adaptation actions

There are a few sets of PowerPoint lecture slides for the previous version of the OER textbook posted on the OER textbook's website. To meet the needs of the present course, these PowerPoint lecture slides were modified.

Student self-assessment using OER is one of the many distinctive features of OER. However, student self-assessment may not be sufficient in the higher education environment, and summative assessment is commonly applied to measure the level of competency of students. The use of all genuine OER materials introduces an issue for summative assessment in higher education because assessment instruments could be open to every student. The issues of academic integrity and educational ethics related to summative assessment in the OER environment have not been widely discussed in the literature. Few services of protected test banks for OER textbooks are available. As the adoption of the OER textbook was not intended to make fundamental changes to the summative assessment scheme and no protected test bank for the adopted OER textbook was available, a set of proprietary assessment instruments, including quiz tests and assignments (e.g., essay topics and discussion questions) was needed for the course.

The course in the present case study required a technical module of computer literacy (e.g., Microsoft Access and/or Excel). The OER textbook did not have companion materials of such a technical module, and a set of teaching and learning instruments for the technical module of computer literacy was needed for the course.

Nowadays, learning management systems (LMS) are used for all online, face-to-face, and blended courses. Implementation of all teaching and assessment materials on LMS is a natural step of full-scale adoption of OER for a course. In this case study, the course had its existing LMS course site before the adoption. Nevertheless, in this case, teaching materials had to be manually inputted into the LMS because of a lack of tools of conversion for incompatible formats. The adaptation actions are summarised in Table 4.

(4) Assessment of student learning outcomes

To evaluate the student learning outcomes in the course with full-scale adoption of OER with adaptation actions, assessment of the OER adoption must be conducted. In the present case study, two data sets were collected from four comparable classes of this course: two classes with the commercial textbook and two classes with OER. The assessment criteria (rubrics) used for evaluating students' learning outcomes of discussions, technical assignments, and course reports in the four classes were the same. Four assessment categories were applied: quiz tests to assess reading, technical assignments to assess technical skills developed through the course, discussions to assess class participation and knowledge sharing, and course reports to assess managerial applications of the concepts. The following is a summary of assessment for the

Table 4. OER Adaptation Actions Matrix in the Case Study

Actions	Benefits	Potential Issues	Estimated Workload	Suggestions
1. Modification of OER PowerPoint lecture sides for the previous version available on the Internet	The PowerPoint lecture slides would meet the course needs and to be consistent with the new version	Need to obtain a permission if the posted PowerPoint lecture slides are not OER	20 hours	A teaching assistant could do this task
2. Modification and creation of a set of discussion questions	The discussion questions would be more suitable for the course	None	8 hours	A teaching assistant could help
3. Creation of a set proprietary quiz tests	Academic integrity and ethics would be maintained	The test bank needs to be secured	60 hours	Two sets might be needed
4. Creation of a set of teaching module of technical assignment	The teaching module of technical assignment would improve students' learning of the textbook as well as computer literacy	The teaching module must be comparable with the university's computing resources	120 hours	A complete set of teaching note, instructions, and assessment instruments for this module are needed
5. Implementation of a course site with all adopted and adapted materials on the Learning Management System	The course could be taught online	The course site is subject to the university's online development and instruction rules	32 hours	Collaboration with university's online development and instruction team is needed

case of OER textbook adoption and adaptation.

- Quiz test results: Students of the classes with OER and students of the classes with the commercial textbook have almost the same performance on quiz tests.
- Quality of technical assignments: Students of the classes with OER and students of the classes with the commercial textbook have almost the same performance on technical assignments.
- Quality of online discussions: Students of the classes with OER can have better performance on discussions than students of the classes with the commercial textbook.
- Quality of course reports: Students of the classes with OER and students of the classes with the commercial textbook have almost the same performance on course reports.

Clearly, the assessment data indicated that the full-scaled adoption and adaptation of OER textbook could

achieve at least the same level of student learning as the commercial textbook did in this course. To understand more about students' subjective opinions on the OER teaching/learning materials and their confidence of learning, surveys were conducted. The survey results revealed the students' overwhelmingly positive attitude towards OER teaching and learning materials and a high level of confidence in learning. The surveys also indicated that textbook cost saving was not a critical factor for students in making decisions of course/section selection, and the quality of OER textbook and its supplemental teaching materials were students' main concern.

Discussion and Contribution

Currently, OER adoption in higher education is still relying on "self-services", and, in comparison with adoption of commercial textbooks, an adoption of OER still demands much more work on the instructors' side for adaptation processes. On the other hand, few general tools have reported in the literature of OER for guiding OER adoption decision making and OER adaptation action planning. The proposed tools can be used for instructors to make decisions in OER adoption and to plan OER adaptation actions. This study contributes to OER in two aspects. First, the adoption decision making procedure and adaptation planning procedure can be applied to any disciplines in higher education for OER adoption. The proposed OER adoption framework can be used for academic units and individual instructors. Second, the study suggests that OER developers and their sponsors can use these tools to estimate the value of their OER products and can provide guidelines for the potential adopters of their OER products.

Conclusion

The adoption and adaptation of OER textbooks are facing many challenges in the higher education sector. A successful adoption of OER to meet the designed learning objectives of the course demands more intellectual work on the instructors' side in comparison with of the adoption of a commercial textbook. The adopting instructors of OER need to perform certain self-services of adaptation that were otherwise provided by the commercial publishers. This study proposes tools of OER adoption decision making and OER adaptation planning. The case study demonstrates the use of the proposed tools. This study concludes that the proposal OER adoption and adaptation tools are useful for all educational institutions and individual faculty members to act for sustainable OER.

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The True and False Promise of Open Educational Resources, or, How Open Educational Resources are Condemned to Wither without Open Pedagogy

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Abstract

Open Educational Resources (OER) are not an overarching panacea which will solve every concern of low-income students. Low- or no-cost material will definitely help every student economically; however, it is only by developing social relationships by the inclusion of everyone's knowledge that OER and Open Pedagogy (OP) will fulfill their true radical, democratic potential. Open Educational Resources have undoubtedly changed the educational landscape, but student outcomes depend upon how we will, as a community of learners, construct it, use it, and improve it. In our view, the solution is to practice Open Pedagogy while using Open Educational Resources.

Keywords: Open Educational Resources, Open Pedagogy, social relationships, alienation, liberation, inclusion

La verdadera y falsa promesa de los recursos educativos abiertos

Resumen

Los Recursos Educativos Abiertos (REA) no son una panacea general que resolverá todas las preocupaciones de los estudiantes de bajos ingresos. El material de bajo costo o sin costo definitivamente ayudará a todos los estudiantes económicamente; sin embargo, solo mediante el desarrollo de las relaciones sociales mediante la inclusión del conocimiento de todos, los REA y la Pedagogía Abierta (OP) alcanzarán su verdadero potencial democrático radical. Los Recursos Educativos Abiertos sin duda han cambiado el panorama

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educativo, pero los resultados de los estudiantes dependen de cómo lo construiremos, usaremos y mejoraremos como comunidad de estudiantes. En nuestra opinión, la solución es practicar la pedagogía abierta mientras se utilizan los recursos educativos abiertos.

Palabras clave: Recursos Educativos Abiertos, Pedagogía Abierta, relaciones sociales, alienación, liberación, inclusión

开放教育资源的真假承诺

摘要

开放教育资源（OER）不是解决低收入学生所有顾虑的万能药。低成本或零成本材料确实能从经济上帮助所有学生；不过，只有通过将每个人的知识包括在内，进而发展出社会关系，OER和开放教学法（OP）才能实现其根本的、民主的潜能。毋庸置疑的是，开放教育资源已改变了教育景观（educational landscape），但学生成果取决于作为学习者社群的我们如何建构、使用和提升OER。我们认为，解决方案是在使用开放教育资源的同时实行开放教学法。

关键词：开放教育资源，开放教学法，社会关系，异化，自由化，包容

Introduction

The murder of George Floyd angered the world. As educators, we have the responsibility to respond, more than ever, to the cries for social justice demanded by many people in America and in the world. How can we, as educators, respond to the issue of democracy, equity, and social justice that we are facing today? Open Educational Resources and Open Pedagogy are one of many solutions that we can use to promote greater democracy, equity, and social justice in today's world. Open Educational Resources and Open Pedagogy can contribute to the common good if we, as educators and political being, use them.

The UNESCO defines Open Educational Resources (OER) as "teaching, learning or research materials that are in the public domain or released with intellectual property licenses that facilitate the **free** use, adaptation and distribution of resources"[1]. Due to their being freely distributed, OER responds to an important student need: the expen-

1 https://en.unesco.org/themes/ict-education/oer Retrieved 7/07/2020.

sive cost of textbooks. This important concern is discussed by professors and administrators in an effort to increase the participation, GPA, retention, and graduation. OER supports the inclusion of every student; this is especially true for low-income students, who are subject to the high cost of higher education. With the exception of big publishing corporations, many educators, administrators, students, and institutions think that OER is fundamental for the future of higher education. However, the economic inclusion provided by OER is only the first step. Using a Marxist critical framework, we argue that this first step, the use of OER with the sole intention of providing low- or no-cost texts to students, especially low-income students, is condemned to fail.

The potential locked within OER can only be reached through the social, cultural, and creative inclusion of all students, especially those whom stories and history had been historically rejected from commercial textbook. David Wiley suggests that "Using OER the same way we used commercial textbooks misses the point." The solution is to use Open Pedagogy to transform the world by offering "activities which actually added value to the world." Geser (2007) defines open pedagogy as "active, constructive engagement with content, tools and services in the learning process, and promot[ing] learners' self-management, creativity and working in teams" (37). Social, cultural, and creative inclusion can be attained through the moderate modification of OER. David Wiley explains that revision causes one to "edit, adapt, and modify your copy of the resource" and remixing allows faculty to "combine your original or revised copy of the resource with other existing material to create something new"[2]. This is why open pedagogy is fundamental to attaining inclusion.

Open pedagogy offers the opportunity to students to create and edit materials for an audience. Members of the audience can be other students, professors, administrators, members of the local community, or members of the world community, depending on the specific media selected.

Students can write or edit Wikipedia materials. Students can illustrate textbooks with the perspectives of underserved and oppressed communities whose voice is excluded from commercial publishing. Students can create test banks and explain their reasoning for excluding the wrong answers. Students can create discussion questions which focus on their own social reality. Students can create videos or add comments on videos which already exist. Students can create pedagogical learning experiences like board games, or specific situations to help other students to understand concepts and theories. Students can create step-by-step templates to guide learners through specific assignments. Students can create assignments. Students can guide the

2 *Defining the "Open" in Open Content and Open Educational Resources* was written by David Wiley and published freely under a Creative Commons Attribution 4.0 license at http://opencontent.org/definition/

reading of the material by including questions on the margins of a textbook. The possibilities of Open Education are endless under such conditions.

To explain these two steps, we will use a different theoretical framework. In the past, OER and OP had been under analyzed theoretically (Bayne, Knox, & Ross, 2015, Deiman & Farrow, 2013, Edwards, 2015, Knox, 2013, Moe, 2015). In recent years, a social justice theoretical framework had been used to achieve this (Hodgkinson-Williams and Trotters 2018, Lambert 2018). Miller (2019) used the real utopian sociologist framework created by Erik Olin Wright (2010, 2012) to theorize OER and OP. Our intention is to use conflict perspective (Marx, Gramsci, and Bourdieu) and the school of Frankfort (Marcuse) to show the power of the OER/OP movement and the dangers which can ruin it.

In the first part of our argument, we will argue that OER and Open Pedagogy can liberate us, professors and students, from the alienation of some of our practices. We also argue that without including the potential creative, social, and cultural inclusion of OER, its economic inclusion is condemned to fail.

In the second part of our argument, we will argue that many barriers can destroy the essence of the OER revolution by reducing it to a simple cultural commodity reproducing cultural inequalities.

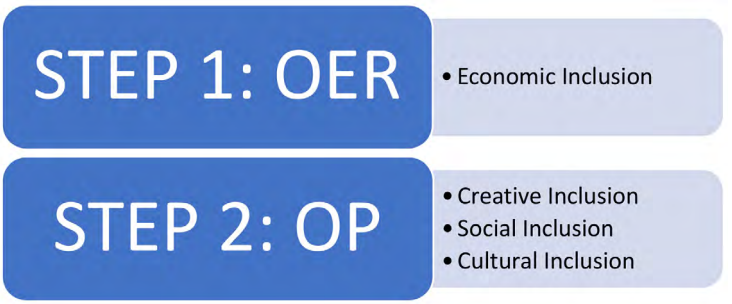

Figure 1. The two steps which can save the OER movement

The Liberating Essence of the OER Movement

From the alienation to the liberation of creativity

Using the concept of alienation (Marx, 1959), or estranged labor, we argue that by responding to their assignments, students are alienated like laborers are alienated when working in a factory. In an assembly line, laborers do not decide how they will produce a commodity. Engineers design the commodity and the way to produce it. Laborers are not workers in the sense that workers create the product and identify the best way to produce it. Laborers only follow directions. This process alienates their creativity. In Marx's words, "this realization of labor appears as loss of realization for the workers."

In this sense, students are like laborers. Most of the time, they are deprived of their creativity when responding to assignments created only by the professor. Students rarely select the topic of their assignment. In the best-case scenario, students are fully informed of the professor's expectations. In the worst-case scenario, students have to know or guess. To respond to this lack of creativity, educators can use Open Education.

Open Education offers the opportunity to liberate students from alienation by creating assignments in which they have to produce knowledge. It can be an individual or a collective creation of knowledge. Students come with assets and interests; by asking them to reveal these assets and interests to their learning community (the professor and to their classmates), we can start a conversation about connecting their talents and their interests to the course content. Assignments can become an opportunity for students to be creative by selecting the topic, the medium (video, papers, photos…), and the evaluations. This process changes the power dynamic in the classroom radically, in the sense that faculty becomes a learner in a community of learner, and an instructor in a community of instructors. The antagonistic approach of instructor learner is replaced by a more democratic process focusing on social relationships (Bingham and Sidorkin, 2004).

From alienation with others to the creation of social relationship

Second, students, in the production of their assignments, are alienated from other students just as laborers are alienated from other laborers in the assembly lines. Laborers are in competition with each other to get a job which will provide a wage to support them. By being in competition which each other, they lose perspective on their class consciousness and their ability to understand that they are united through the same conditions of exploitation. For Marx, "the fact that man is estranged from the product of his labor, from his life activity, from his species-being, is the estrangement of man from man. When man confronts himself, he confronts the other man."

Students are also alienated from other students but in a different way. Students are not in competition for wages; yet they compete against each other to receive the best possible grades or to be known by their professor to benefit from them, in the form of letters of recommendations, teaching assistant opportunities, research opportunities and so on. Students are also alienated because they compose their assignments for only one person: the professor. This process does not create intellectual exchange nor the development of a community.

Open Pedgogy offers the opportunity to create relationships between people by sharing the knowledge which is produced. An intellectual creation becomes an intellectual creation only by being shared with an audience that can agree or disagree, and thus critique the work. The intellectual work can be passed on to future students in the course, to the campus community, the

local community, students friends and family, or to a larger public by using the Internet. Regardless of the audience, what is important is diffusion with the intention of fostering human relationships. In "The Gift," Marcel Mauss suggested that first societies created social relationships between different groups or tribes by exchanging gifts. The person or group receiving the gift is "forced" to reciprocate at a later date. This exchange in creates society. This is what Open Educational Resources can offer to our society: creating a society by freely diffusing produced knowledge based on the work of another person or group. The advantage of diffusion of knowledge is that it eliminates the "forced" reciprocity between individuals or groups who are in relationship and know each other. This diffusion of knowledge can create a new collective consciousness based on organic relationships (Durkheim, 2014) between people who don't know each other but create knowledge regardless of differences and singularities.

From cultural exclusion to cultural inclusion

Textbooks, as a commodity, are put on the market for profit. To maximize profits, publishing compagnies create products which are "tested" on the most populated states in the United States. Publishers do not provide a cultural product, but a pure commodity designed to provide a higher benefit in the form of profit. It is a commercial entreprise and not an intellectual one. To be profitable, these materials promulgate a mass-market cultural narrative which legitimizes and supports the status quo. By doing so, many cultural perspectives are deleted or ignored. In this sense, textbooks are an excellent example of cultural hegemony (Gramsci, 1971). At an international level, textbooks written from Eurocentric and North American perspectives are an agent of cultural imperialism which promote the supremacy of the Eurocentric and North American view and the inferiority of the non-occidental perspective. Quinn and Vorster (2017), discussing protestors in South Africa, explained that they were protesting the westernized word view offered in higher education and the limited inclusion of "scholars from the Global South" (p. 131) At every level, textbooks vehicle the social and cultural reproduction (Bourdieu and Passeron, 1990) of inequality by diffusing a culture which has been institutionalize by the and for the powerful. The textbook is a commodity which includes the culture, values, and beliefs of the powerful while denying the experiences and realities of oppressed groups.

OER offers the opportunity for every group and every community to participate in the diffusion of knowledge. Every standpoint, every perspective, every experience can be included to provide a variety of world views. OER is the perfect tool to challenge the power dynamic in the production and diffusion of knowledge (Cox, Masuku, and Willmers 2020). However, OER is only a tool and much depends how we are use it. OER can also be used against OP and against the inclusion that it represents.

The Danger of OER

The fight in and over the OER movement

The Open Educational Resource movement, like every social movement, is affected by two types of conflicts. The first type is internal to the movement and represents a conflict over the institutionalization of the definition. Pierre Bourdieu discusses this process in terms of field when analyzing art and literature (Bourdieu 1993, 1995). For Bourdieu, different groups exist in the art world and the literary world. These different groups vie with each other to control, legitimize, and institutionalize their own definition of what art and literature should be. By controlling the definition, the group assures its status, prestige, and revenue. The same process happens in the OER and OP movement. It is present in any movement, regardless of its democratic, egalitarian, social justice or inclusive nature. Despite its intrinsic nature in any movement, the resolution of this conflict can divide, affect, or destroy any movement. By recognizing and understanding the process, members of the movement can use this dynamic to reinforce the democratic process instead of destroying it.

The second type is external. The OER movement decreases the revenues and profits of publishers. Publishers responded and are responding to the movement by creating a counter-movement to assure their continued profits. One technique used by publishers is to sue organizations which promote OER. In 2012, Boundless, an OER "start up," was sued by Pearson, Cengage, and Macmillan. The three publishers accused Boundless of copyright violation for three specific products of their catalogue[3]. In June 2020, Penguin Random House, HarperCollins, Hachette and Wiley sued Internet Archive for violation of copyright (Harris 2020). These concrete examples are a way to intimidate educators, administrators, universities, and compagnies invested in OER. A less aggressive technic used by publishers was the adoption of inclusive access (McKenzie, 2017). Inclusive access is a strategy used by an institution to assign to an entire class the same electronic copy of the material. Students are not buying the material individually. Their institution of higher education purchases the commercial material at a discount price and the cost is included as a part of students' tuition fees. This approach, selected by some institutions of higher education, seems interesting in terms of cost saving and assuring that students have the same material on the first day of class. On the other hand, it is largely invisible- students may not see the cost of purchasing educational material. Regardless of the strategy used, a conflict between publishers selling commercial material and the OER movement providing free material is happening and is affecting the movement's success.

3 See https://www.insidehighered.com/blogs/hack-higher-education/oer-textbook-start-up-sued-publishers-copyright-infringement retrieved on July, 18, 2020.

The possible fetishization of OER as commodity

Using the concept of fetishism of commodities, we argue that it is important for every educator who selects OER on any level to discuss the intention of saving money (economic intention) and to explain the intention of OER as a social movement to share knowledge (political intention). Without discussing and explaining these two ideas with students, OER can become a fetish, "an object believed to have magical power.[4]" In "Capital," Marx used the following adjectives to describe the fetishization of the commodity: "mystical", "mysterious", "enigmatical", "fantastic", "necromancy". OER can be venerated because it is free. Everyone likes what is free, but they do not realize that nothing is free. Using the opposing logic, OER can be rejected because it is free. Some people believes that what is free has less value than something paid for. OER can become a positive or negative fetish, a form of talisman in which the content and the intention is disregarded because of the absence of cost[5]. To destroy the fetishism of OER as a form of commodity, it is important to discuss the political and economical reasons of production, consumption, and transformation of OER. If it is not done, OER will be simply consumed as a vulgar form of cultural product, and will not be successful in transforming social relationships. As a simple commodity, OER would simply perpetuate alienation between human beings.

The commodification of OER

In addition, we need to be careful of the commodification of Open Educational Resources. Commodification is the process of transforming a public or private social relationship into a commodity which can be bought or sold. The commodification process generally involves the use of an expert who sells its knowledge, understanding, and practices, as well as the diffusion of a culture of experts who possess greater knowledge and experience than the "non-expert". In traditional societies, family members and community members take care of children or the elderly. Taking care of other was based on a social relationship. Today, educators and health care providers, individuals possessing expertise, take care of children and the elderly for a fee. In the case of Open Educational Resources, many companies are offering services, for a fee, to support OER. For example, in courses which require using Lumen material, the cost for the material is $25.00 per students but it can goes to $33.00[6] if the course requires the use of skill build-

4 Definition from the Merriam-Webster dictionary https://www.merriam-webster.com/dictionary/fetish retrieved on July, 18, 2020.

5 Marx explains: "Consequently it was the analysis of the prices of commodities that alone led to the determination of the magnitude of value, and it was the common expression of all commodities in money that alone led to the establishment of their characters as values. It is, however, just this ultimate money form of the world of commodities that actually conceals, instead of disclosing, the social character of private labour, and the social relations between the individual producers." (The Capital)

6 https://lumenlearning.com/how/payment-options/ Retrieved 7/06/2020

ing and peer community, that is, "if the professor also wants to participate in Circles" (Young, 2020). ITS Learning, a learning platform "includes 5 million quality open educational resources[7]" and offers LMS implementation, LMS Integration, Content Management, and Professional Development[8] for a fee. OER is a new market and compagnies want a piece of what appears to be a very rich cake. However, these compagnies, by providing services which may be needed by some instructors, school districts, or universities, are destroying the essence of OER. These companies are transforming a social relationship between members of an intellectual community into a market. They are organizing the commodification of OER. We can only predict that the idealist creators of knowledge who offer their work for free may stop doing so after seeing that their effort is profiting companies. This commodification process reduces their work to a product.

The technological rationality of OER

Finally, the focus on technology may be another downside of the OER movement. In North America, the discussion on economic inclusion and increasing access has been integrated into a technological perspective. This unfortunate way of thinking assumes that technology can solve every concern of our societies. It is what Herbert Marcuse (1982, 1991), one of the main philosopher of the Frankfurt School, call technological rationality. Instead of focusing on the roots of a concern, technological rationality assumes that technology will provide a solution. This fetishization of technology, excluding the political acumen of humans and their ability to create the world around them, is condemned to fail.

This argument was illustrated by Funk and Guthadjaka (2020) when they discussed open platforms. They explained that "that emancipatory digital technologies such as open platforms may reproduce western knowledge domination, a feature that has marked the entire history of cultural and linguistic relations between white Australia and Aboriginal and Torres Strait Islander communities. Such domination is not the explicit aim of these 'open' technologies which ostensibly seek to democratise access and participation, but because they are structured with western knowledge and reliant on English proficiency, they create conditions of exclusion just as they do inclusion." (2020, p. 2)

Conclusion

OER is not a miracle solution which will solve every concern of low-income students. Low- or no-cost material will definitely help every student economically. However, it is only by developing social relationships by the inclusion of everyone's knowledge that OER and OP will fulfill their true radical democratic potential.

7 https://itslearning.com/us/gooru/ Retrieved 7/06/2020

8 https://itslearning.com/us/services/overview/ Retrieved 7/06/2020

OER is a great tool. But like every great tool, the result depends on how we will together, as a community of learners, construct it, use it, and improve it. In our view, the solution is to practice Open Pedagogy when using Open Educational Resources.

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Using OER for Professional and Curricular Development: Lessons from Two Composition Textbooks

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Abstract

The composition program at Maryville University was allocated funds to replace the textbooks used in a two-course introductory-level sequence with OER materials. While full-time faculty organized the effort to compose two new textbooks, part-time faculty were the primary authors for most chapters. Full-time and part-time instructors who created materials participated in a series of workshops and one-on-one editing sessions. The creation of these OER materials ultimately helped to save over 100,000 dollars annually, but also yielded a range of benefits for a program infusing online and on-ground courses with a newly redesigned curriculum. There were distinct benefits to being able to customize materials for a new curriculum with authors who knew the specific student population. The professional development opportunity for both full-time and part-time faculty also increased communication and a sense of community across the program. Students surveyed about the materials rated them highly. Surveys were also sent to faculty participants, who reported that they felt they benefited significantly from the experience of authoring OER texts and that the collaboration process was impactful.

Keywords: OER development, professional development, curriculum, faculty training

Uso de REA para el desarrollo profesional y curricular: lecciones de dos libros de texto de composición

Resumen

Se asignaron fondos al Programa de Composición de la Universidad de Maryville para reemplazar los libros de texto utilizados en una secuencia de nivel introductorio de dos cursos con materiales REA. Mientras que los profesores de tiempo completo organizaron

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el esfuerzo de redactar dos nuevos libros de texto, los profesores de medio tiempo fueron los autores principales de la mayoría de los capítulos. Los instructores de tiempo completo y tiempo parcial que crearon materiales participaron en una serie de talleres y sesiones de edición individuales. La creación de estos materiales REA finalmente ayudó a ahorrar más de 100.000 dólares anuales, pero también produjo una serie de beneficios para un programa que incorpora cursos en línea y presenciales con un plan de estudios recientemente rediseñado. Hubo distintos beneficios al poder personalizar los materiales para un nuevo plan de estudios con autores que conocían la población estudiantil específica. La oportunidad de desarrollo profesional para los profesores de tiempo completo y parcial también aumentó la comunicación y el sentido de comunidad en todo el programa. Los estudiantes encuestados sobre los materiales los calificaron altamente. También se enviaron encuestas a los participantes de la facultad, quienes informaron que sentían que se beneficiaron significativamente de la experiencia de la creación de textos REA y que el proceso de colaboración fue impactante.

Palabras clave: Desarrollo de REA, desarrollo profesional, plan de estudios, formación de profesores

使用开放教育资源进行专业发展和课程开发：两本创作课本得出的经验

摘要

玛丽维尔大学的创作计划（Composition Program）获得专项资金，用于在两门导论课中使用开放教育资源（OER）代替传统课本。尽管全职教师组织了两本新课本的创作，但兼职教师是大多数章节的主要作者。创造该材料的全职和兼职教师参与了一系列研讨会以及一对一编辑会议。这些OER材料的创造最终帮助节省了每年超10万美元的费用，同时还为创作计划—将重新设计的课程设置融入网络及线下课程—带来了一系列益处。让了解特定学生群体的作者为一门新课程定制材料是有明显好处的。全职和兼职教师的专业发展机会也增加了该计划中的传播和社群感。接受调研的学生对OER材料的评价很高。教师也参与了调研，他们报告称，自身从创作OER内容的经历中受益良多，并且协作过程具有影响力。

关键词：OER开发，专业发展，课程，教师培训

Introduction

As the use of open educational resources continues to grow, much of the conversation continues to focus on the cost benefit for students and, in turn, the institutions they attend (Fischer, Hilton, Robinson, & Wiley, 2015). Our article extends a recent trend (Staben, 2019) of thinking about OER at the level of the academic program or department, rather than primarily a contract between the institution and individual faculty members. While the university saved money and individual faculty were compensated for their roles as authors and editors, we focus on the program and professional development benefits here. In this current age of austerity, the development of OER resources has been the most significant professional development opportunity our department has been able to support.

Two years ago, the Composition program at Maryville University was given the opportunity to develop our own OER materials. In working through this process, we discovered benefits to professional development, faculty involvement, and curriculum development. Full-time and adjunct instructors were offered the opportunity to be compensated for developing content. The decision was made to create a new textbook for each introductory composition course, with single or co-authored chapters. This meant that 14 instructors (11 part-time and 3 full-time) were able to author sections of the OER. After the materials were completed and published in our learning management system (LMS), we offered additional professional development to train new and experienced faculty in using the new materials. The process of planning, developing, implementing, and evaluating our OER materials has been a benefit not only to our students and institution, but to our team of instructors. Our program is much more unified in what we teach, how we teach, and the assignments we use than we were before this opportunity arose.

Review of the Literature

Student and Institutional Benefits

Given that textbooks are linked to student success (Skinner & Howes, 2013), increasingly cost more than students can afford (Whitford, 2018), and that faculty can be reluctant to adopt OER alternatives (Jung, Bauer, & Heaps, 2017), it makes sense that a great deal of the literature surrounding OER initiatives focuses on cost, student success, and faculty buy-in (Fischer et al., 2015; Hilton, 2016.) For instance, the Babson Survey Research Group has monitored faculty perceptions about OER since 2014 and has found that faculty increasingly understand the impact of textbook costs on students (especially those faculty in leadership roles), and that faculty also increasingly adopt OER and less-expensive digital materials (Seaman & Seaman, 2018). Even still, less than half of faculty were aware of OER in 2018 and only 13 percent of them were willing to make OER adoptions (Seaman & Seaman, 2018). Even if COVID-19 and the need to adapt materials and lessons

for online environments have increased awareness of OER alternatives (McKenzie, 2020), there remains a lag in faculty awareness of OER and in the willingness to adopt OER once made aware.

While faculty are increasingly aware of the need for lower cost texts, it is equally important that faculty who use OER texts see an impact on student learning outcomes and retention. Studies indicate that use of OER positively affects these measures of student success. A multi-institutional study by Fischer et al. (2015) explored the impact of OER on learning outcomes, course completion, and retention. In these three measures of student success, the study found that students using OER generally performed as well or better than students not using OER. Interestingly, when evaluating enrollment trends, students who used OER were significantly more likely to enroll in more credit hours the following semester.

Colvard et al. (2018) disaggregated data to assess student success outcomes of OER use based on financial need, ethnicity, and registration status, leading to a conclusion of OER as an "equity strategy for higher education: providing all students with access to course materials" (p. 273). This study found that end-of-course grades improved and rates of DFW (D grades, failures, and withdrawals) decreased for Pell Grant recipients when enrolled in a class using OER. In regards to registration status, the study revealed that the use of OER helped narrow the achievement gap between part-time and full-time students. A similar result was found when considering the disaggregated data based on ethnicity.

Faculty Benefits and Professional Development

As OER initiatives gather momentum in higher education, and as the evidence for their effectiveness grows, there has been increasing critical focus on faculty development initiatives aimed at familiarizing instructors with OER and incentivizing them to adopt these materials.

While most of these discussions center on how to aid faculty in adopting existing materials (Belikov & Bodily, 2016; LaMagna, 2019), there have been some studies of faculty involvement in customizing and/or creating new OER. Nevertheless, the majority of these explore the challenges of implementing incentive structures (grants, individual payments, reassigned time, leadership opportunities) for an endeavor that resists a one-size-fits-all approach (Dilley, 2018; Todorinova & Wilkinson, 2020; Zhadko & Ko, 2020).

Most useful to the present study are recent discussions of OER as professional development that emphasize the potential for these initiatives to strengthen pedagogy and foster collaboration. For example, DiSanto et al. (2019) and Pate et al. (2019) explore the impact of making OER professional development opportunities available to various stakeholders across the university, including faculty, students, and library staff. Part-time faculty should be included among these stakeholders, especially in programs that tend to rely

heavily on such instructors. Yet, there seems to be little discussion of providing OER professional development opportunities aimed specifically at helping part-time faculty to produce OER. As Dilley (2018) notes, there are often institutional structures in place that actively discourage this kind of outreach.

While discussions of incentives for part-time faculty participation in professional development need to start with considerations of fair monetary compensation, Zhadko & Ko (2020) point out that OER faculty development provides related skill-building in online pedagogy and course design, and often offers leadership opportunities. These can be valuable for faculty looking to build their portfolios. Kinskey & Lewis Miller (2019) offer a successful example of this in practice, where graduate teaching assistants were invited to help in the creation of new OER materials. All participants reported that this was a valuable experience.

One of the reasons that fair compensation is so important to the discussion of OER adoption is that, even for instructors who are using OER materials created by others, there is significant time and effort that goes into gathering appropriate OER resources from various sites and sources. With adjunct salaries for most part-time instructors well below the poverty line in the United States (Flaherty, 2020), expecting adjunct instructors to curate resources for a course as well as teach it is an equity concern as well as a logistical one.

Within the field of composition there are several large repositories for OER materials that an instructor would need to comb through to locate materials. The increase in OER efforts means that the materials at the Writing Commons, the Writing Across the Curriculum Clearinghouse, *Lumen Learning,* and even individual university platforms, have grown at a considerable rate even in the two years since we made the decision to create our own materials. This is one of the reasons why libraries have become so important to OER adoption. Without the assistance of the library in curating OER, the task can be overwhelming for individual faculty members. With the exception of the resources available at *Lumen Learning*, most of the resources available for composition instructors also then have to be integrated into a learning management system. With many part-time instructors teaching on multiple LMS platforms at different institutions each semester, OER adoption could seem more like a tax on an instructor living below the poverty line than a benefit.

Additionally, as noted by Herron (2016) in reference to the Writing Commons open resource for composition materials, opening up the process of creating OER to a group of faculty members can reveal multiple pedagogical approaches in our content areas. The collaborative development of open materials presents opportunities to draw on diverse voices and perspectives. It is also an opportunity to compensate the labor of part-time instructors.

Methodology

In the summer of 2018, Alex, the Director of Composition at Maryville University, had a meeting with one of our University's chief technology officers. The meeting was primarily about Canvas shells, but the topic turned to a new university-wide initiative: the development of OER textbooks. Because Maryville University buys books for students under a "one fee" program, the university was willing to incentivize faculty to develop and use OER resources to keep costs down. Composition, with more than a hundred sections, was considered a "high-value target" for the new OER program.

While the OER incentive program did not leave room to negotiate the dollar amount, it did have two different levels of funding. The director could choose to simply adopt an existing text or texts currently available in OER format and receive professional development funds. Those funds would be enough to fund two summer workshops to introduce the new materials and to support curriculum development. The director could develop most or all of the materials and receive funds for authorship and editorship, with enough funding to pay for four professional development workshops (three-day summer workshops for two years).

To be blunt, none of these options seemed ideal at the moment they were proposed. As a program, we had gone through the process of creating a new mission, new goals, and new outcomes for our courses one year prior. We had also just chosen new textbooks that supported the new mission, goals, and outcomes. The process of choosing textbooks had come with no funding for professional development, so getting feedback from instructors had taken time and effort beyond what it may have. Alex and Christina, who was an adjunct instructor at the time, had also finished an update of the online versions of our two-course sequence (English 101 and 104) a year prior that involved using outside OER materials for both courses. Alex and Christina felt that the materials were effective, and students responded well to the readings, but instructors who taught both online and onground were still planning on using the new textbooks rather than the OER materials that had been gleaned for the online course. Alex was concerned about resistance to standardization if the program moved away from textbooks that were freshly chosen by a large number of instructors to outside OER resources.

Also, the development would need to take place over the course of a calendar year (for budgetary purposes) and the thought of designing an entire textbook by himself in that amount of time was daunting to someone in his second year of a five-year tenure track. Because the book would only be available to Maryville University students, it would only ambiguously count in a tenure portfolio. This seems to be true for OER initiatives at many institutions (Todorinova & Wilkinson, 2020).

At the same time, the offer was presented as a pilot that could become

more than a voluntary university initiative, with less funding associated with later iterations. That is, the department could potentially take a large pot of money for a lot of work now or we might be asked to take a much smaller pot of money for just as much work later. Additionally, the OER pilot contract was only three years. The department would be able to renegotiate for additional funds, or simply move back to outside textbooks, in three years.

Given the choices, Alex decided that the most prudent course of action would be to write both books for the larger amount of money—and to use that money as broadly as possible. If editing and authoring roles could be spread across the program, this would be the most money for professional development the program ever has available. Faculty would also have the chance to more fully embrace the new curriculum the program had piloted and just selected textbooks for. The more recent textbook adoption would mean that the instructors authoring the in-house versions of chapters would be able think about what they wanted their own chapters to look like as they experimented with new textbooks. They would be able to identify what worked and what did not work for their students as they were writing. Alex informally asked several instructors (especially those who were excited about the new textbooks) if they would be interested in being paid to compose OER materials to replace the recently adopted textbooks. He received a positive response, with several instructors expressing excitement and appreciation at being valued as authors. Thinking about OER as professional and curricular development, rather than primarily about saving money for the university or for students, made the decision an easier one to make.

Alex began the process by surveying OER initiatives more broadly. While other universities centralize OER development through their libraries (Temesio, 2020; LaMagna, 2019), Maryville University is small enough where departments and faculty need to do this kind of legwork themselves. Alex contacted colleagues at other universities who had experience with OER materials, but he found those departments facilitated OER adoption by individual faculty members without developing in-house materials.

It was at this point that Alex asked Christina and Vaughn to take the lead in editing each of the textbooks. Christina would edit English 101 materials, and Vaughn would edit English 104 materials. The three of us would collectively make all the editorial decisions, put on professional development meetings, and help instructors complete their chapters. Christina was, at the time, a part-time instructor who had already gone through adopting OER materials with the online courses, and Vaughn was a full-time faculty member with a wealth of editorial experience.

The three of us set out to review composition specific OERs that we could use as models for our own projects. We also began the process of educating ourselves about copyright and fair use, as our roles in this project would require us to make editorial

decisions that had perhaps not come up before in our careers. This research impacted several instructors who were new to authorship in ways that they said made it into their own classrooms. This has meant that more of our composition courses feature chances for students to learn about copyright and fair use when they learn about plagiarism. The professional development meetings that we had around this topic also help instructors see ways they could customize their chapters for Maryville students. Rather than generic images of college students, authors could—for instance—get permission from Maryville to use Maryville promotional images. Similarly, faculty brought their own pictures into their final products.

After Alex and Christina had integrated OER materials into the online courses there had been significant developments at Lumen Learning (and their partnership with the SUNY system). Because Lumen resources are already integrated in Canvas (our current LMS), if their developments had matched our curriculum, adopting some of what was available at Lumen would have been easier because it would have avoided the "last mile" (Kortemeyer, 2013) problem with collecting OER materials: there is often a formatting challenge when it comes to presenting OER inside an LMS. Because Lumen's resources were designed to work within Canvas, we would have less formatting work to do if we did decide to adapt materials from Lumen. While we decided that Lumen's materials were not a match for our curriculum, we were impressed by the design possibilities within Canvas. All three of us had experience designing online Canvas shells for other instructors to use, but we had gone into this process thinking we would need to do some designing outside of Canvas to accomplish our goals. After reviewing what was available at Lumen, we knew that working fully within Canvas was a possibility and a desirable one if we wanted our faculty to be able to edit materials quickly.

Rather than post a general call for chapter proposals first, we decided to put out a rough outline of the chapters we thought we would need to complete the two books, based on our research and experience with the online courses. We emailed all the instructors in the program announcing the OER opportunity and asked them what additional chapters they might want to contribute. Response from the instructors was positive, with faculty suggesting ideas for additional content. For instance, faculty suggested that we address the health professions in our textbooks at several points because an overwhelming percentage of Maryville University students major in one of the health professions. Similarly, faculty wanted to make sure that digital literacy was given more attention than it had been in our adopted textbooks. With this information, we put together a final list of chapter topics.

Next, we created a list of materials we wanted to have inside each chapter. For instance, we asked everyone for outcomes, assignment options, writing prompts, readings, relevant non-copyrighted images, relevant video exam-

ples, rubrics, tips for writers, and tips for instructors teaching the chapters.

Once we had our outline in place, we sent out a call for proposals within the program. We already knew we had part-time instructors with long publication histories that might be interested. We also knew that some of our part-time instructors were new to publication. Our first call for proposals was met with a lot of questions, but not as many proposals as we had hoped. We recruited some instructors to write chapters who had never published before. We also encouraged instructors to submit proposals for more than one chapter, anticipating that some chapters may be more popular than others.

After gathering enough proposals, we met to discuss the proposals. With some chapters not generating enough interest from potential authors, we each selected a chapter to write ourselves. That gave us 16 accepted chapters, with two authors deciding to write two chapters.

We offered several professional development brainstorming and writing sessions to get authors started on their chapters. We also shifted the topics of our traditional department-wide professional development meetings to be helpful to authors.

Another key editorial decision was to publish directly in Canvas. In addition to already having experience in using Canvas for our online design and instruction, we also believed that making updates and edits directly in Canvas would be smoother. Additionally, this would allow instructors to publish assignments and readings in the OER directly from the Canvas LMS.

To help with revising and editing chapters, we sent a first round of personalized feedback to each writer based on their draft. The first round of feedback also included an updated timeline for when to submit revisions, when authors would receive the next round of feedback, and when final drafts would be due. Authors responded that the first round of feedback was helpful in providing additional guidance for the chapter and ideas for moving forward.

After authors submitted revisions from the first round of feedback, we met again to discuss next steps for the chapters. In the second round of feedback, we sent authors an updated checklist and models of mostly completed chapters. Once we had full drafts of the chapters loaded into Canvas, we gave each author the ability to make corrections in a last round of feedback.

With several of our chapters-in-progress, authors found themselves unable to complete the work that they initially had planned. In these cases, the editors arranged solutions that included co-authoring chapters and incorporating excerpts from incomplete chapters into other chapters that were on track for completion. We also faced the opposite issue: too much material or too many assignments. In these cases, we guided authors in selecting those aspects of their chapter that fit our redesigned curriculum.

As we were finishing editing the chapters, Alex put together a summer workshop series to introduce the new

OER materials. All returning and new instructors were given (viewing, not editing) access to all the OER materials. The workshops were a chance to introduce the new materials, but also a way for part-time instructors to be paid for building courses with new texts. Christina and Vaughn gave everyone a tour through the material in each textbook to start the workshops, and authors were asked to discuss the material and example assignments in their chapters. The materials were well received. Most instructors had not yet read through all of the OER materials, so there was ample discussion about choices and possibilities.

Instructors were then given time to select readings and work in groups as they built the assignment sequences they wanted to use. Groups were first created based on which courses instructors were teaching in the fall. Next, even smaller working groups were created based on what instructors wanted to work on first. Some wanted to start building out particular assignments, while others wanted to focus on unit structures.

The goal of these summer workshops was for instructors to leave with rough drafts of their syllabi for the fall. Almost all instructors met this goal. Being paid to do the kind of preparation that is usually unpaid was appreciated.

All of these efforts led to much more standardization in the curriculum. While standardization can be seen as a risk rather than a reward, we would argue that this depends on a department's situation. For instance, when Alex was hired as the new Director of Writing and Multimodal Composition, he undertook a review of the program. After extensive syllabus review and interviews with instructors, it was determined that, aside from a research essay in English 104, there were no unifying assignments in the program and that requirements varied wildly depending on the instructor.

While others have noted that faculty are often concerned about the implications of standardization when making OER adoptions (Reed, 2018), writing the OER materials in-house meant that there was extensive faculty buy-in. The materials were clearly customized for our students (several chapters begin with a direct address to Maryville University students and use examples from our campus) and tied to what faculty were already teaching. Because we asked for sample assignments with each chapter, faculty were engaged in an extensive process of sharing materials with their colleagues.

There would have been another round of workshops, with instructors getting paid to personalize the OER materials for their courses, but a budgetary emergency caused by the fallout from COVID-19 meant that all professional development funds not yet spent were swept into a fund for preparing to teach in a hybrid format.

Findings

It is certainly true that one of the significant benefits of adopting OER materials for a course or program

can be cost savings. Previously, our two-course sequence had three different textbooks for each course. These textbooks were selected by instructors. The cost to the university was between 110 and 130 dollars per student. With more than 1,000 students in these courses annually, Maryville University has saved more than 100,000 dollars a year for the past two years.

After publishing our OER materials in our LMS, we embedded a link to a survey in each of the chapters for students. Students were able to give feedback on various aspects of each of their chapter readings. In the survey, students gave qualitative and quantitative feedback on the quality, usefulness, readability, and relevance of each chapter.

In analyzing the survey responses, students have responded positively to the instructor-created materials. The majority of students surveyed rated each chapter as having a higher quality and usefulness than traditional textbooks. The majority of students also rated the chapters as easy to read and saw the relevance of reading the chapter to their success in the course.

Students completed surveys for individual chapter materials. In total, 80% (67 out of 84) of students rated the quality as better than traditional textbooks. Eighty-six percent (72 out of 84) students rated the usefulness as better than traditional textbooks. Eighty-one percent (68 out of 84) students rated the chapter as easy to read. Eighty-seven percent (73 out of 84 students) responded that it was easy to see the relevance of reading the chapter to their success in the course. Research shows that students rate their connection to courses that use OER as higher than courses that use traditional materials (Fine & Read, 2020).

Multiple students commented on the interest and readability of the chapters. For example, one student wrote, "It was interesting to read and easy to understand." Students also noted the relevance of the content of the chapters. For example, one student commented, "It's better coming from the actual teacher than just a textbook. Feels more hands on."

Another major benefit we have found is the usefulness of our OER materials for both students and instructors. As part of our OER review process, we created an anonymous survey for all composition instructors. Several instructors completed the survey and offered their feedback on the quality and usefulness of our materials for their students and for themselves. We asked if instructors believed having OER materials available in Canvas is helpful to their students and to themselves as instructors. Ten out of ten respondents answered yes.

One instructor expanded on why the OER materials are helpful: "Since the information is more carefully chosen, I feel as if the students are more apt to make associations between the reading and their assignments, which increases the probability of retaining the information." Another instructor noted that the "materials are approachable and interactive."

In the survey, instructors who worked on developing OER materials mentioned that they found the experience to be valuable as professional development. For example, one instructor noted, "This experience provided opportunities not usually afforded to adjuncts: collaborate with colleagues, take a deeper dive into researching topics that are vital for students' growth, and place a publication on my CV."

Beyond these instructor survey results, we asked for feedback in a follow-up survey to gain insight into how instructors felt about the value of OER authorship in relation to other professional development opportunities. In this short survey, we posed two questions and eight authors responded. In the first question, we asked faculty to rate the professional development experience of authoring a chapter with other professional development opportunities provided by the university. Five out of eight authors rated the experience as significantly better than other professional development at the university. Two out of eight rated the experience as moderately better than other professional development at the university. One out of eight rated the experience as neither better nor worse. In the second question, we asked faculty to rate the professional development experience of authoring a chapter with other professional development opportunities outside of the university. Five out of eight authors rated the experience as significantly better than other professional development outside of the university. Two out of eight rated the experience as moderately better than other professional development outside of the university. One out of eight rated the experience as slightly better.

Last year, instructors who collaborated on the OER materials were given the opportunity to create a statement to our university's Board of Trustees. Various instructors commented on how participating in creating our OER materials was a benefit professionally. One instructor highlighted the sense of professional value that working on our materials created:

> The most amazing part about contributing to the composition OER is the rare opportunity for adjuncts to help create the foundational material from which they are asked to teach. The very fact [that] my knowledge and experience is valued as more than just something adjacent to the English Department and university helps foster a sense of belonging with my colleagues.

The development of our OER materials encouraged a higher level of consistency among instructors and their sections of composition. OER authors embedded various instructional materials in the OER modules, including assignments, writing projects, class activities, and collaborative work. Within each module, instructors had multiple options for meeting course outcomes through various writing project options. Authors also worked to build in scoring rubrics for assignments and writing projects. This model has an added advantage for new instructors as they are able to immedi-

ately access a fully planned and developed curriculum.

Student and faculty resources built into the OER materials led to another essential feature of our development and deployment process, which was the training for our instructors. We offered an orientation and guided tour of the materials through summer training workshops. All composition instructors were offered the option to attend a series of workshops offered the summer before our OER materials went live in our classes. Attendees were compensated for their participation through significant professional development funds.

It is our belief that the training was important for promoting buy-in from faculty who were going to be using these materials. Trainings were a paid opportunity for instructors to collaboratively prepare for their class(es) with the new materials in a new format. As Dilley (2018) notes, OER initiatives often tend to focus on training full-time faculty, but we felt that encouraging participation from our part-time faculty was crucial to our developing curriculum. The open process of creating in-house textbooks helped create opportunities for part-time and full-time faculty to engage in the kinds of extensive pedagogical discussions that can be difficult to support financially. The ability to renew our textbooks, with funding from the university, every three years is also a chance to renew the openness of our own pedagogical relationships. We will not be switching back to outside textbooks when our three-year contract is finished. The opportunity to edit, revise, add chapters, share pedagogy, and build community is too valuable to pass up.

Besides offering presentations within our department, our OER experience led to ideas for presentation opportunities involving both full-time and part-time faculty. As an example, we highlighted our development of a multimedia writing project from our OER materials at a teaching and technology conference.

Our OER materials were originally developed for our traditional, on-ground classes. In using the materials for those courses, we found that we could also transfer some of the material to our online classes. For example, we decided to use our "Introduction to Summary" chapter in the summary module for our English 101 course. While this required minor adjustments, the extra support for online students learning foundational expectations and strategies for writing a summary has been an advantage for instruction. We plan on replacing more of the outside OER materials in our online courses with the materials that were created in-house when there is additional funding made available for a significant redesign of those courses.

Conclusions and Recommendations

From our experience with developing and implementing OER materials, we believe that OER could be used more frequently for faculty and

curriculum development. Through involvement of both full-time and part-time instructors in the program, we were able to build a relevant and useful OER product for the benefit of our students and our faculty team. For OER development projects, we would recommend considering the professional and curricular benefits of involving various faculty members.

With programs relying on adjunct faculty extensively for instruction, we believe building involvement opportunities for those same faculty members with the development of materials they are to teach only makes sense. This investment in both full-time and part-time faculty to create materials they are using has paid dividends for our program for both the student and faculty experience.

We would also recommend intentional training and continual professional development opportunities in the use and implementation of new materials. It is our belief that the creation and use of OER materials in our program has led to greater student success and faculty satisfaction through the relevancy and customization of the materials for our program and curriculum. If universities can be convinced that OER efforts are not solely about saving students money, but effective means of curricular and professional development, it may be possible to alter the calculus that makes so little OER development funding available at some institutions.

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Appendix A

Student Survey of OER Materials

1. Rate the quality of the chapter.
    a. Much better than other published textbooks
    b. Moderately better than other published textbooks
    c. Slightly better than other published textbooks
    d. Neither better nor worse than other published textbooks
    e. Slightly worse than other published textbooks
    f. Moderately worse than other published textbooks
    g. Much worse than other published textbooks
2. Please take a moment to expand upon your answer and offer feedback about the quality of this chapter.
3. Rate the usefulness of the chapter for this class.
    a. Much better than other published textbooks
    b. Moderately better than other published textbooks
    c. Slightly better than other published textbooks
    d. Neither better nor worse than other published textbooks
    e. Slightly worse than other published textbooks
    f. Moderately worse than other published textbooks
    g. Much worse than other published textbooks
4. Please take a moment to expand upon your answer and offer feedback about the usefulness of this chapter.
5. How easy or difficult was it to read the chapter?
    a. Extremely easy
    b. Moderately easy
    c. Slightly easy
    d. Neither easy nor difficult
    e. Slightly difficult

f. Moderately difficult

g. Extremely difficult

6. How easy or difficult was it to see the relevance of reading this chapter to your success in this class?

    a. Extremely easy

    b. Moderately easy

    c. Slightly easy

    d. Neither easy nor difficult

    e. Slightly difficult

    f. Moderately difficult

    g. Extremely difficult

7. Would you recommend that we use this chapter next year as it is? If so, why? If not, what do you think we should change?

8. Please take a moment to provide any other feedback you might have about this chapter.

Appendix B

Faculty Survey of OER Materials

1. Do you believe having the OER materials available in Canvas is helpful to your students?
    a. Yes
    b. No
    c. No
    d. Unsure
2. Do you believe that having materials available in Canvas is helpful to you as an instructor?
    a. Yes
    b. No
    c. Unsure
3. Rate the quality of our composition OER materials vs conventional textbooks.
    a. Much better than other published textbooks
    b. Moderately better than other published textbooks
    c. Slightly better than other published textbooks
    d. Neither better nor worse than other published textbooks
    e. Slightly worse than other published textbooks
    f. Moderately worse than other published textbooks
    g. Much worse than other published textbooks
4. Please take a moment and expand on your answer and offer feedback about the quality of Maryville's OER materials.
5. Rate the usefulness of these materials for your students
    a. Much better than other published textbooks
    b. Moderately better than other published textbooks
    c. Slightly better than other published textbooks
    d. Neither better nor worse than other published textbooks

e. Slightly worse than other published textbooks

f. Moderately worse than other published textbooks

g. Much worse than other published textbooks

6. Please take a moment and expand on your answer and offer feedback about the usefulness of Maryville's OER materials.

7. Would you be interested in writing OER materials in the future (with compensation)?

    a. Yes

    b. No

    c. Unsure

8. What changes or updates would you make to our OER materials?
9. Do you teach in any other programs at Maryville? If so, how do the composition OER materials compare to the materials used in those programs?

10. We encourage instructors to edit OER materials to best suit their classes. Have you ever edited OER materials?

    a. Yes

    b. No

11. If you have edited a chapter, please briefly describe your edits and your reasons for making the edits.

12. Did you author any of the materials included in our English 101 or English 104 OERs?

If yes:

13. Would you be interested in writing another chapter in the future? (Assuming the compensation was similar.)

    a. Yes

    b. No

    c. Maybe

14. Was this experience valuable to you as professional development?

    a. Yes

b. No

c. Maybe

15. Please take a moment to explain how your experience connected to your broader professional development.

If no:

16. Would you be interested in editing a chapter in the future? (Editors are compensated.)

    a. Yes

    b. No

    c. Maybe

17. Would you be interested in authoring a new chapter in the future? (Authors are compensated.)

    a. Yes

    b. No

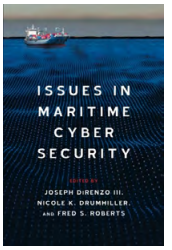
    c. Maybe

Appendix C

OER Authorship Professional Development Survey

1. How would you rate the professional development experience of authoring a chapter in English 101 or 104 at Maryville University with other professional development opportunities (like REAL week) provided by Maryville University? (The experience of authoring includes the researching, writing, and editing of the chapter, any workshops you attended as part of the OER process, and then teaching your own materials.)
    a. Much better than other PD at Maryville
    b. Moderately better than other PD at Maryville
    c. Slightly better than other PD at Maryville
    d. Neither better nor worse than other PD at Maryville
    e. Slightly worse than other PD at Maryville
    f. Moderately worse than other PD at Maryville
    g. Much worse than other PD at Maryville
2. How would you rate the professional development experience of authoring a chapter in English 101 or 104 at Maryville University compared with professional development you have had outside of Maryville University? (The experience of authoring includes the researching, writing, and editing of the chapter, any workshops you attended as part of the OER process, and then teaching your own materials.)
    a. Much better than other PD outside Maryville
    b. Moderately better than other PD outside Maryville
    c. Slightly better than other PD outside Maryville
    d. Neither better nor worse than other PD outside Maryville
    e. Slightly worse than other PD outside Maryville
    f. Moderately worse than other PD outside Maryville
    g. Much worse than other PD outside Maryville

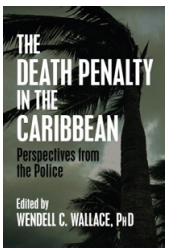
Featured Titles from Westphalia Press



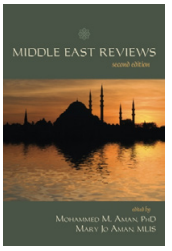
Issues in Maritime Cyber Security Edited by Nicole K. Drumhiller, Fred S. Roberts, Joseph DiRenzo III and Fred S. Roberts

While there is literature about the maritime transportation system, and about cyber security, to date there is very little literature on this converging area. This pioneering book is beneficial to a variety of audiences looking at risk analysis, national security, cyber threats, or maritime policy.

The Death Penalty in the Caribbean: Perspectives from the Police Edited by Wendell C. Wallace PhD



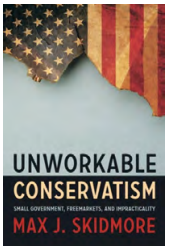
Two controversial topics, policing and the death penalty, are skillfully interwoven into one book in order to respond to this lacuna in the region. The book carries you through a disparate range of emotions, thoughts, frustrations, successes and views as espoused by police leaders throughout the Caribbean



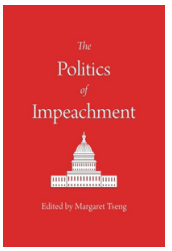
Middle East Reviews: Second Edition
Edited by Mohammed M. Aman PhD and Mary Jo Aman MLIS

The book brings together reviews of books published on the Middle East and North Africa. It is a valuable addition to Middle East literature, and will provide an informative read for experts and non-experts on the MENA countries.

Unworkable Conservatism: Small Government, Freemarkets, and Impracticality by Max J. Skidmore



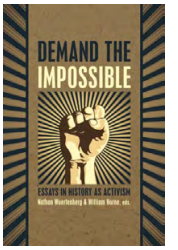
Unworkable Conservatism looks at what passes these days for "conservative" principles—small government, low taxes, minimal regulation—and demonstrates that they are not feasible under modern conditions.



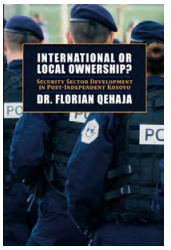
The Politics of Impeachment
Edited by Margaret Tseng

This edited volume addresses the increased political nature of impeachment. It is meant to be a wide overview of impeachment on the federal and state level, including: the politics of bringing impeachment articles forward, the politicized impeachment proceedings, the political nature of how one conducts oneself during the proceedings and the political fallout afterwards.

Demand the Impossible: Essays in History as Activism
Edited by Nathan Wuertenberg and William Horne



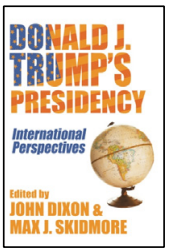
Demand the Impossible asks scholars what they can do to help solve present-day crises. The twelve essays in this volume draw inspiration from present-day activists. They examine the role of history in shaping ongoing debates over monuments, racism, clean energy, health care, poverty, and the Democratic Party.



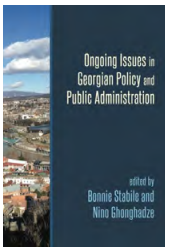
International or Local Ownership?: Security Sector Development in Post-Independent Kosovo
by Dr. Florian Qehaja

International or Local Ownership? contributes to the debate on the concept of local ownership in post-conflict settings, and discussions on international relations, peacebuilding, security and development studies.

Donald J. Trump's Presidency: International Perspectives
Edited by John Dixon and Max J. Skidmore



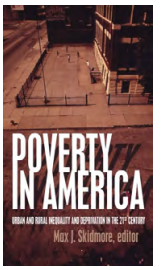
President Donald J. Trump's foreign policy rhetoric and actions become more understandable by reference to his personality traits, his worldview, and his view of the world. As such, his foreign policy emphasis was on American isolationism and economic nationalism.



Ongoing Issues in Georgian Policy and Public Administration
Edited by Bonnie Stabile and Nino Ghonghadze

Thriving democracy and representative government depend upon a well functioning civil service, rich civic life and economic success. Georgia has been considered a top performer among countries in South Eastern Europe seeking to establish themselves in the post-Soviet era.

Poverty in America: Urban and Rural Inequality and Deprivation in the 21st Century
Edited by Max J. Skidmore



Poverty in America too often goes unnoticed, and disregarded. This perhaps results from America's general level of prosperity along with a fairly widespread notion that conditions inevitably are better in the USA than elsewhere. Political rhetoric frequently enforces such an erroneous notion.

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