



Comparing a Faculty-Created OER and Commercial Textbook: Student Outcomes and Perceptions

RESEARCH ARTICLE

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ABSTRACT

This research study compares student outcomes and perceptions in two in-person sections of the same community college business law course: one with the previously used commercial textbook and the other with an open textbook created by the faculty specifically for the course outcomes. The faculty was motivated to create the open textbook to make the course more accessible to students by reducing the course materials cost, by creating the textbook with understandable content for the students, updated examples, and case studies that could be easily updated in the future, and by providing the textbook in multiple formats, including both digital and print, to meet their students' diverse learning and access needs. Students from both sections were surveyed at the end of the term to learn of their perceptions of the textbooks. Withdrawal rates, course grades, and enrollment intensity the following term were compared for the two sections while accounting for student-level variables including prior GPA, prior college experience, and enrollment intensity that term. There was no significant difference between the two sections in terms of final grades, withdrawals, or enrollment intensity the following term. Neither was there a significant difference in how students rated the usefulness of their textbook, but students in the open textbook section rated their textbook significantly higher in quality than students in the commercial textbook section.

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open educational resources; community colleges; course grades; textbook affordability; textbook adoption; business law; retention rates; student outcomes; student perceptions; equity

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The cost of textbooks is a contributor to the rising cost of higher education (Bureau of Labor Statistics, 2016; Bureau of Labor Statistics, 2023). Tuition increases over the last three decades have been accompanied by the crippling growth of student debt (Congressional Research Service, 2022; Hanson, 2024a; United States (U.S.) Department of Education, 2015). The cost of college has more than doubled in the 21st century and continues to increase while students face rising interest rates (Hanson, 2024a; Hanson, 2024b). These challenges are compounded for students of low socioeconomic status and minority students, as they are disproportionately impacted by the price of education, hindering their chances of succeeding in college and later finding a job (Hardin et al., 2019; Jenkins et al., 2020; Levine, & Ritter, 2023; Mustaffa & Dawson, 2021; Nusbaum et al., 2020; Sanchez et al., 2024; Spica & Biddix, 2021). As a percentage of tuition, the cost of textbooks is much higher at community colleges than at four-year institutions (College Board, 2023). Indeed, students at two-year public institutions are twice as likely to be “extremely worried” about course materials costs and to select their institution based upon these costs than are students at 4-year institutions (Bay View Analytics, 2023).

According to a survey from Florida Virtual Campus (2022), the high cost of textbooks negatively affects student access, success, and completion. Students reported not purchasing the required textbook (53.5%), earning a poor grade (32.4%), and failing a course (19.2%) due to the cost. They also occasionally or frequently took fewer courses (43.7%), did not register for a course (38.5%), dropped a course (24.2%), or withdrew from courses (20.7%) due to the cost (Florida Virtual Campus, 2022). This is echoed in the Bay View Analytics (2023) finding that 71% of students reported being worried about course materials costs. Students reported that the cost of course materials caused them to take fewer courses (57%), not register for a specific course (53%), earn a poor grade (41%), drop a course (35%), withdraw from a course (34%), fail a course (31%), or go without course materials (14%), with 83% of students reporting at least one of these negative impacts (Bay View Analytics, 2023). Studies measuring the impact of textbook costs on marginalized populations reflect even higher rates of stress and educational burden on historically underserved students (Jenkins et al., 2020; Lo et al., 2023).

Open Educational Resources (OER), “teaching, learning, and research materials that are either (a) in the public domain or (b) licensed in a manner that provides everyone with free and perpetual permission to engage in the 5R activities (retain, reuse, revise, remix, redistribute),” offer an alternative to commercial course materials (Creative Commons, n.d.; Wiley & Hilton, 2018). Pedagogically, OER provides faculty with unique and highly adaptable options for student learning and engagement that come with using course content licensed with Creative Commons licenses (Biddle & Clinton-Lisell, 2023). Faculty are able to have greater control over their course material and customize it specifically for their classes. Faculty can revise and remix their course material to keep it updated and incorporate relevant content that would be specifically useful for diverse learners. Seaman and Seaman (2018) found that faculty already revise and remix content in their traditional textbooks, making the “5R” activities of open content useful for their current practices. Using open content allows faculty to personalize and contextualize the content to make it more relevant to their students’ lives and experiences and to support students during challenging aspects of their courses (Van Allen & Katz, 2020).

Levy and Tila (2022) describe how student perceptions that faculty care for them can profoundly affect their learning. Utilizing OER along with effective frameworks, such as Culturally Responsive Teaching, and curating course content to help students connect what they are learning with their lives and experiences can demonstrate to students that faculty care. By explaining to students what OER is, the effort that faculty put into curating the course resources, how faculty expect these resources to benefit the students, and, especially, that faculty did this because they care about the students and their learning, faculty can foster a strong connection with students and caring learning environment (Levy & Tila, 2022). Finally, they suggest asking for feedback to see if students perceive the same benefits intended by the faculty member in order to inform future course revisions (Levy & Tila, 2022). This not only supports continuous improvement, but further demonstrates to students that faculty value their input and experiences. This echoes Hegarty’s (2015) attributes of successful open pedagogy such as creating a community where people trust each other, feel willing to share their work, and give and receive feedback for continual improvement and development.

Open Educational Resources also offer students a variety of formats for access, including digital and print. For example, students could read the digital version on their computer or phone when they do not wish to carry around the print version. Digital versions often include added features to aid learning, such as keyword searching, the option to annotate text, multimedia, and interactive components. Print options allow students to read the text when they do not have internet or computer access, while holding and notating a tangible learning object. While many students prefer print to digital for learning purposes (Baron et al., 2017; Gleeson et al., 2021; Mizrachi, 2015; Mizrachi & Salaz, 2022; Spica & Biddix, 2021), student learning and grades are not necessarily affected with the use of digital textbooks (Fischer et al., 2015; Rockinson-Szapkiw, Courduff, et al., 2013; Rockinson-Szapkiw, Wendt, & Lunde, 2013). Flexibility in format allows students to choose when and how they access the text.

Community colleges are particularly important places to implement OER textbooks, as course materials represent a high percentage of tuition costs at these institutions, which disproportionately impacts students' ability to afford college attendance (College Board, 2023). Community colleges offer many introductory courses with stable content, which lends well to the OER format (Hilton et al., 2013). They also serve as an entry point to higher education for first generation students and students from underserved populations or low socioeconomic status who would benefit greatly from reduced costs of higher education (Community College Research Center, 2021; Student PIRGs, 2016).

In recent years, over half of all U.S. states have considered or implemented OER legislation (SPARC, n.d.). The impact of statewide OER policies on reducing the cost of course materials can be seen in annual reports from organizations such as Open Oregon Educational Resources. According to data gathered by Open Oregon Educational Resources over a six year period, the average cost of course materials required to complete the two year Associate of Arts Oregon Transfer (AAOT) degree at Oregon community colleges in 2015 was equivalent to 231.66 hours of work at minimum wage, and course materials represented 25.27% of tuition costs per credit hour. By 2021, course materials represented only 11.18% of tuition per credit hour, and the minimum wage work equivalent had reduced to 89.70 hours. Overall, the data indicates a 47% drop in the cost of an AAOT degree since implementation, proving that free and low-cost course material requirements can make a difference in college affordability (Open Oregon Educational Resources, 2022).

While OER promotes equity by offering increased access to higher education for students and the ability for faculty to customize course content, faculty want to be sure that OER are also high quality and help their students succeed by meeting learning outcomes. This study provides a unique contribution to the body of OER literature on student outcomes and perceptions when OER are used by comparing two sections of the same course at a community college, one using a faculty-created OER textbook customized for the course and one using a commercial textbook. It controls for both course-level variables including instructor, term, course delivery method, textbook format, syllabus, sequencing of materials, in-class instructional material, writing assignments, and material covered in quizzes and exams (although not the questions on the quizzes and exams), and student level variables including previous academic experience, prior GPA, and enrollment intensity at the beginning of the term. It compares differences in the OER and commercial textbook sections including course grades, withdrawals, enrollment intensity the following term, and student perceptions of textbook quality and usefulness.

This study is guided by two research questions. The first question is about student perceptions: (1.) Was there a significant difference in how students rated the quality and usefulness of the commercial text and the OER text? The second question is about student outcomes: (2.) Was there a significant difference in student final course grades, the withdrawal rate, or enrollment intensity the following term between students enrolled in the OER section and the commercial textbook section when controlling for student-level variables including previous academic experience, prior GPA, and enrollment intensity at the beginning of the term?

LITERATURE REVIEW

COUP Framework

This study utilizes two aspects of the COUP Framework, developed by the Open Education Group (Open Education Group, 2023), which proposes investigating cost, outcomes, usage and

perceptions related to the use of OER and open-pedagogy in order to determine their impact in secondary and post-secondary education (Open Education Group, 2023). The Open Education Group replaced the COUP Framework with the SCOPE Framework in 2023, after the data for this study had been collected (Clinton-Lisell et al., 2023). The SCOPE Framework expands upon the COUP Framework to include social justice, outcomes, perceptions, and engagement (Clinton-Lisell et al., 2023).

This study examines the outcomes and perceptions aspects of the COUP Framework with the use of OER. The framework suggests measuring student outcomes with the use of OER through changes in student achievement metrics, such as grades, persistence, enrollment intensity and graduation rates (Open Education Group, 2023). It suggests investigating stakeholders' thoughts and feelings about the use of OER and open pedagogy related to, for example, their effectiveness, rigor, coverage, and formats (Open Education Group, 2023).

Student Outcomes

As OER has grown in use, the number of studies on the effectiveness of OER in relation to student learning and their impact on student outcomes has increased. As a whole, these studies demonstrate that the use of OER has correlated with the same or better educational outcomes when compared with the use of commercial textbooks (Cho & Permzadian, 2024; Clinton & Khan, 2019; Hilton, 2020; Mullins & Hoffman, 2023; Tili et al., 2023). However, in order to improve study design, multiple studies have attempted to control for different student-level variables, such as prior experiences, socioeconomic status, and identities; and course-level variables, such as the instructor, delivery of instruction, assessments, semester, day, time, course materials format, and modality. The majority of these studies found that students had the same or better outcomes in course assignments, exams, and/or final course grades when OER were used (Allen et al., 2015; Baker & Sibona, 2020; Clinton, 2018; Colvard et al., 2018; Dempsey, 2021; Engler & Shedlosky-Shoemaker, 2019; Grinias & Smith, 2020; Jhangiani et al., 2018; Medley-Rath, 2018; Winitzky-Stephens & Pickavance, 2017), while several found that some students had worse outcomes (Delgado et al., 2019; Kersey, 2019). In terms of student withdrawal rates, Winitzky-Stephens and Pickavance (2017) found no difference between OER and commercial textbook sections; Clinton (2018), Colvard et al. (2018), and Delgado et al. (2019) found significantly lower withdrawal rates in OER sections; and Dempsey (2021) found significantly higher withdrawal rates in OER sections.

OER has also been shown to correlate with enrollment intensity the following term (Fisher et al., 2015) and the same term (Clinton-Lisell, 2023). Griffiths et al. (2022) examined OER degree pathways and found that students who used OER accumulated credits at a significantly faster rate than students who did not. These studies demonstrate OER having a positive effect on the number of credits students enroll in.

Several studies also included findings on student outcomes in relation to student-level variables, providing insight into how different aspects of course material, such as cost, accessibility, and format, may affect different student groups. Colvard et al. (2018) performed a fairly large study, including eight courses that had adopted OER, most of which were OpenStax textbooks, which generally include both digital and print options. They found that non-white students, Pell-eligible students, and part-time students had greater improvements after OER adoption than white students, non-Pell-eligible students, and full-time students, suggesting that providing all students with access to course materials from the first day of class can reduce barriers to student success (Colvard et al., 2018). Delgado et al. (2019) studied a single course comparing a traditional textbook and commercial online homework platform to an OER consisting of "an e-text, videos, and online homework problems, centrally hosted on an open online learning platform" (p. 188). They found that freshmen and sophomores did not perform as well with OER, international students performed significantly better with OER, and Pell-eligible students also performed better, although the effect size was small (Delgado et al., 2019). They expected that the subtitled videos in the OER course provided international students with the opportunity to rewatch the videos and better understand the course content (Delgado et al., 2019). Dempsey (2021) studied seven courses that adopted OER, some by OpenStax, but the majority in which the faculty had remixed free or open digital content. They found no significant difference overall in final grades for OER sections and no significant differences for Pell-eligible students, first time students or part-time students, but they did find significantly lower final grades

for Black/African American students (Dempsey, 2021). Also, a higher proportion of Hispanic students withdrew from OER sections compared to white students, but the Hispanic students who completed the term earned significantly higher final grades in OER sections (Dempsey, 2021). They suggest further research to determine if the digital nature of the OER material may be creating barriers for underserved students who may be less comfortable with technology or lack access to reliable internet or technology resulting from the digital divide (Dempsey, 2021). Overall, these findings suggest the importance of considering not just how OER can support students through cost savings, but also focusing on supporting all students through frameworks such as Universal Design for Learning, Culturally Responsive Teaching, Transparency in Learning and Teaching, and Open Educational Practices to create accessible, engaging and meaningful learning experiences for all students (Vold, n.d.).

Student Perceptions

Most studies on student perceptions of OER quality found that the majority of students perceive OER to be the same or better quality than commercial textbooks (Bliss, Hilton, et al., 2013; Bliss, Robinson, et al., 2013; Clinton, 2018; Delimont et al., 2016; Hendricks et al., 2017; Hilton, 2020; Ikahihifo et al., 2017; Illowsky et al., 2016; Jhangiani et al., 2018; Jhangiani & Jhangiani, 2017; Lindshield & Adhikari, 2013; Mullens & Hoffman, 2023; Ross et al., 2018; Squibb et al., 2023; Watson et al., 2017; Wynants & Dennis, 2022), while Gurung (2017) found that students rated the quality of the commercial textbook higher than the OER. These studies assess student perceptions of OER quality differently, leading Zawacki-Richter et al. (2023) to present the Instrument for Quality Assurance of OER for use in future studies on OER quality and in practice for OER development and adoption. For example, Clinton (2018), asked students to rate the visual appeal, diagrams and tables, photographs and illustrations, questions to test understanding, chapter summaries, the way it was written, and every-day life examples. Students rated the commercial textbook marginally, but not significantly, higher than the commercial textbook in terms of visual appeal, but did rate the open textbook significantly higher in terms of the writing (Clinton, 2018). Open-ended responses showed that students liked the writing and organization of the commercial textbook, but did not like the physical print features, size, and weight (Clinton, 2018). They liked the affordability, writing, electronic access, and electronic features of the open textbook, but disliked reading from screens and other digital aspects of it (Clinton, 2018). Jhangiani et al. (2018) used the Textbook Usage and Assessment Scale (TAUS) to rate helpful figures, easy to understand figures, helpful tables, easy to understand tables, relevant photographs, effective research examples, effective everyday examples, helpful everyday examples, relevant everyday examples, number of study aids, helpful study aids, visually appealing textbook, visually distracting textbook, engaging writing, understandable/clear writing. However, they also included a global question about quality in which students rated the overall quality of the OER higher than the commercial textbook (Jhangiani et al., 2018). They explained that while it is unclear how students interpreted this global question, “their TAUS ratings indicate that they perceived the print format of the open textbook to be superior on substantive dimensions such as the effectiveness of the research examples and the clarity of the writing” (Jhangiani et al., 2018, p. 15).

Similarly, most studies on student perceptions of the usefulness of OER in helping them achieve the outcomes for their course found that the majority of students perceive OER to be at least as useful as commercial textbooks (Abramovich & McBride, 2018; Bliss, Hilton, et al., 2013; Cozart et al., 2021; Feldstein et al., 2012; Hilton et al., 2013; Kelly et al., 2024; Ryan & Nawalaniec, 2021; Wynants & Dennis, 2022). Gurung (2017) found in one study that there was no difference in how students rated the helpfulness of the OER as compared to the commercial textbook. However, in the second study, students rated the commercial textbook as being more helpful than the OER.

There have been many studies reporting positive and negative student comments about their OER. Students liked the digital features of the OER allowing increased access (Bliss, Hilton, et al., 2013; Bliss, Robinson et al., 2013; Cooney, 2017; Feldstein et al., 2012; Grissett & Huffman, 2019; Hendricks et al., 2017; Lindshield & Adhikari, 2013; Ozdemir & Hendricks, 2017; Ross et al., 2018; Ryan & Nawalaniec, 2021; Squibb et al., 2023; Wynants & Dennis, 2022). They also liked OER that contained relevant, updated content (Cozart et al., 2021; Feldstein et al., 2012; Gurung, 2017; Jhangiani et al., 2018; Ozdemir & Hendricks, 2017) and that was customized

to their course (Bliss, Hilton, et al., 2013; Bliss, Robinson, et al., 2013; Hendricks et al., 2017; Lindshield & Adhikari, 2013). Students also liked that the OER explained the topics well and was clear and easy to understand (Bliss, Hilton, et al., 2013; Hendricks et al., 2017; Jhangiani et al., 2018; Wynants & Dennis, 2022). Finally, they appreciated that it was free (Bliss, Hilton, et al., 2013; Bliss, Robinson, et al., 2013; Clinton, 2018; Cooney, 2017; Grissett & Huffman, 2019; Hendricks et al., 2017; Lindshield & Adhikari, 2013; Ross et al., 2018; Ryan & Nawalaniec, 2021). Negative comments focused on lack of visuals, low quality visuals, formatting issues, and errors (Clinton, 2018; Grissett & Huffman, 2019; Gurung, 2017; Lindshield & Adhikari, 2013; Ozdemir & Hendricks, 2017; Wynants & Dennis, 2022). Students also frequently reported wanting a print version for note-taking, increased access, or to avoid screen fatigue (Bliss, Hilton, et al., 2013; Bliss, Robinson, et al., 2013; Hendricks et al., 2017; Jhangiani et al., 2018; Lindshield & Adhikari, 2013; Wynants & Dennis, 2022). Faculty can use OER to support students through reducing costs and providing multiple means of access and engagement with the material to meet the learning outcomes. OER creators can share their work in a way that allows faculty in local contexts to easily customize or remix it for their specific student needs (Farrow et al., 2024).

Individual faculty have the ability to curate materials specifically for their courses to create learning experiences where students can relate the content to their lives (Levy & Tila, 2022). Kelly et al. (2024) found correlation between student grades and students seeing themselves reflected in the curriculum. They utilized Lambert's (2018) framework for social justice applied to OER and found that, "students' perceptions of cognitive justice (i.e., perceptions of gender and racial/ethnic identity representation in course materials) were associated with final course grades. This suggests there may be performance benefits related to students being able to 'see themselves' represented in course materials" (Kelly et al., 2024, p. 257).

Current Study

This study adds to this body of research by comparing student outcomes and perceptions of a faculty-created OER in a community college while controlling for both student and course-level variables.

METHODS

RESEARCH METHOD

This study compares differences in course grades, withdrawals, enrollment intensity the following term, and student perceptions of textbook quality and usefulness in two sections of a business law course: one section using a new faculty-created OER and one using the previously used commercial textbook. It controls for instructor, term, course delivery method, textbook format, syllabus, sequencing of materials, in-class instructional material, writing assignments, and material covered in quizzes and exams (although not the questions on the quizzes and exams). It also accounts for student-level variables including prior GPA, prior number of college terms completed at the institution, prior transfer and dual enrollment credits completed, and number of credits enrolled in during the term of the study. In order to control for each variable, it was not possible to extend this study for additional terms. This study took place during Fall 2018, the first term when the OER was adopted. We could justify requiring the OER for one section and the commercial text for the second section for one term to see how the OER worked for the students, but it would be unethical to continue requiring one section to use a commercial text for the sake of a study if the faculty felt the OER had satisfactorily enabled students to meet course outcomes.

SAMPLING

This study investigates the adoption of faculty-created OER in a business law course at a community college in Oregon. In order to retain anonymity of study participants, due to the small sample size, we will not report on specific population demographics of this community college, but rather share demographics of community colleges in Oregon which are fairly representative. Approximately 25% of community college students in Oregon identified as students of color during 2018–19; 17% identified as first generation college students, while the first generation status of 56% was unknown, indicating that the true percentage is likely higher; 43% were enrolled as part-time undergraduate students; and 35% were unable to meet college expenses with their expected resources, including family contributions, student earnings, and

grant aid ([Oregon Higher Education Coordinating Commission, n.d.](#)). The demographics at this community college were similar, but had slightly lower percentages of students of color and students who were unable to meet college expenses with their expected resources.

The library at this community college supported OER adoption on campus through an OER librarian and grants for faculty to create and adopt OER. The faculty of a business law course received a grant to create their own OER text for the course to replace the existing commercial textbook that they had been using. This business law course is transferable to universities and also required for a degree. The faculty was motivated to do this because of the high cost of the commercial textbook they had been using, wanting their students to have less of a monetary burden when taking their course. In addition, they wanted to design and update the textbook specifically for the material that they taught in their course.

The OER textbook they created had two separate parts: (1.) the textbook and (2.) case studies and diagrams. The case studies and diagrams were referenced throughout the main text as an appendix and were shared in the same ways as the main text. The faculty chose to keep the case studies and diagrams separate from the textbook so that they could be updated easily.

The OER librarian and the accessibility services department worked closely with the faculty throughout the OER creation and authoring process. The accessibility services department helped them make sure that their textbook met accessibility standards. The OER librarian helped them through the OER creation process including support for developing project guidelines, navigating campus OER textbook adoption procedures, advising on editing, copyright, format and access options, archiving the textbook in an institutional repository, and adding it to OER Commons.

A link to the PDF of the OER was provided in the course syllabus and links to specific chapters were provided in the learning management system (LMS). A print version of the OER text, including case studies and diagrams, was offered for sale in the college bookstore at cost and was also available on reserve at the college library for students to check out. The college bookstore sold out of the original order of print copies, which prompted an additional order for students. The college library reported that the reserve copy of the OER was checked out six times during the term.

The same faculty member who created the OER taught two sections of the course during Fall 2018, with one section using the commercial textbook and the other using the newly created OER. The faculty was asked to randomly assign either the OER or commercial textbook to each of the two course sections. Students self-selected by enrolling in one of the two course sections.

At the beginning of the term, the OER librarian visited the course section using the OER textbook and taught students how to access and use the PDF version of the textbook and reference the case studies and diagrams. They also explained that the print version was available in the bookstore and on reserve at the library. New copies of the commercial print version retailed for \$192.60 at the college bookstore during Fall 2018. There was also an ebook option for \$56.99.

During the term, students provided the faculty and the OER librarian with suggestions for edits and improvements which they compiled and used to make changes for future implementations. The faculty received a grant to revise the course based upon student feedback over Summer 2019. This included working extensively with the elearning department to integrate the readings from the textbook into the LMS and expanding the support materials for the textbook.

While the adoption of this OER textbook saved students money and offered them the ability to keep the print and digital versions of the textbook after the term was completed (as opposed to the ebook version of the commercial textbook which was only available to students for the duration of the term), the faculty wanted to know that students were also able to use the text to learn and ultimately succeed in the course and continue in their studies the following term.

RESEARCH DESIGN

This study utilizes the COUP Framework developed by the Open Education Group ([2023](#)) that suggests examining different aspects of cost, outcomes, usage and perceptions when studying the impact of OER and open pedagogy in higher education. This study specifically uses a quasi-experimental design that looks at student course outcomes and student perceptions of their textbook in two sections of the same course, one using a newly created OER and one using the previously used commercial textbook.

This first research question is about student perceptions: (1.) Was there a significant difference in how students rated the quality and usefulness of the commercial text and the OER text? The second research question is about student outcomes: (2.) Was there a significant difference in student final course grades, withdrawal rate, or enrollment intensity the following term between students enrolled in the OER section and the commercial textbook section when controlling for student-level variables including previous academic experience, prior GPA, and enrollment intensity at the beginning of the term?

The proposal for this project and all materials including the student survey and informed consent form were reviewed and approved by the college's office of institutional research and administration before the study began since the college did not have an institutional review board (IRB). After the study took place but before submission of this manuscript for publication, this study was also filed with Pacific University's IRB since the authors had become affiliated with Pacific University during that time period.

RESEARCH PROCEDURES

During Fall 2018, the same faculty taught two in-person sections of the business law course to account for course-level variables. One course section was taught with the commercial textbook used previously and the other with the faculty's newly created OER textbook. The OER and the commercial textbook were assigned to each course section by the faculty. The faculty used the same syllabus, sequencing of material, in-class instructional material, writing assignments, and material covered in the quizzes and exams (the questions were different) in both course sections. The faculty needed to use different questions on the quizzes and exams to match the content of the textbook used for each section, but attempted to make them of equal difficulty. The faculty was able to use the same written assignments for both sections.

The textbook information for each course section was made available through the college's bookstore system and in the syllabus for each section. For the section with the OER textbook, the syllabus contained a link to a PDF of the textbook. The weekly readings from the textbook were also shared via the LMS in PDF format. A printed version of the OER text, including the case studies and diagrams, was available for purchase at cost from the college's bookstore. A print copy was also placed on reserve at the library for students to check out for a short period of time. Since the commercial textbook was also available in the bookstore in either print or digital format, this helped control for textbook format since students in both sections had the choice to access either a print or digital version.

DATA COLLECTION TOOLS

Student perception data (i.e., survey data on students' perceptions of the textbook) were obtained from 13 of the 25 students assigned the commercial textbook and 22 of the 30 students assigned the OER. A paper survey was administered at the end of the term to each section of the course. An administrative assistant administered and collected the surveys for each section while the faculty was absent from the room. The surveys included an informed consent form which was signed by each student. To determine students' perceptions of the quality of each textbook, the survey asked, "How would you rate the quality of this textbook compared to other textbooks that you have used in the past?" Answer choices included the following statements which we assigned the following ratings for analysis: (+1) Better quality than other textbooks, (0) Same quality as other textbooks, and (-1) Worse quality than other textbooks. To determine students' perceptions of the usefulness of each textbook, the survey asked, "How useful was this textbook in helping you learn the course content and complete the coursework?" Answer choices included the following statements which we assigned the following ratings for analysis: (0) Not useful, (1) Somewhat useful, (2) Very useful. To gather qualitative data about student perceptions of the textbooks, two open-ended questions were included: (1.) "What did you like about this textbook?" and (2.) "What did you dislike about this textbook?" The student answers to these questions were coded for each of the two sections and the frequency that each code was mentioned was recorded as shown in [Table 1](#).

Student outcome data were collected from the office of institutional research which included the following information for the 25 students in the section assigned the commercial textbook and the 30 students in the section assigned the OER: final grade, whether the student withdrew,

number of credits enrolled at the beginning of the second week of Fall 2018, number of credits enrolled at the beginning of the second week of Winter 2019, prior GPA, number of transfer, dual credits, and dual enrollment credits, number of terms completed at the college (not including dual enrollment). Data could not be disaggregated as per federal reporting guidelines. As shown in [Table 2](#), these two groups of students were not significantly different with respect to prior GPA, total enrolled credits for the semester of interest (Fall 2018), prior college credits (including transfer-in credits), or number of terms completed.

VALIDITY AND RELIABILITY MEASURES

Given that there were no confounding differences detected between the two groups, independent-samples *t*-tests were used to compare the final grades (in GPA format) and enrollment intensity of the students assigned the OER and the students assigned the commercial textbook. A chi-square analysis was used to compare the withdrawal rates across the two groups. Finally, independent-samples *t*-tests were also used to compare the students' ratings of the quality and usefulness of the commercial and OER textbooks.

RESULTS

STUDENT PERCEPTIONS OF OER QUALITY AND USEFULNESS

Students assigned the OER rated the textbook significantly higher in quality ($M = 0.57$, $SD = 0.60$) than students assigned the commercial textbook ($M = 0.15$, $SD = 0.38$), $t(32) = -2.25$, $p = .031$. The difference in the two groups' ratings of the usefulness of the textbook did not differ significantly (OER $M = 1.55$, $SD = 0.60$, Commercial $M = 1.85$, $SD = 0.38$), $t(33) = 1.63$, $p = .112$.

STUDENT TEXTBOOK PREFERENCES

Open-ended comments about what students liked about the OER focused on it being accessible digitally, directly matching the course content, and having simple and clear language ([Table 1](#)). Students also liked the examples, design, and features of the digital version, and that it was free. In contrast, the positive comments for the commercial textbook were primarily focused on it being helpful to the course content, containing clear and direct language, and including good examples. Students also liked the color, format and definitions of vocabulary. Negative comments about the OER focused on errors and the flow of the content. Students also disliked the difficult vocabulary and that the content was in grayscale rather than color. Negative comments for the commercial textbook described the content as being outdated and lacking in flow, and expressed dissatisfaction with the book being unbound and lacking multimedia.

	1. WHAT DID YOU LIKE ABOUT THIS TEXTBOOK?	FREQUENCY MENTIONED	2. WHAT DID YOU DISLIKE ABOUT THIS TEXTBOOK?	FREQUENCY MENTIONED
OER Section n = 19	Digital access	7	Flow of content	5
	Directly matching the course content	6	Errors	4
	Simple, clear and direct language	6	Difficult vocabulary	2
	Good examples	2	Grayscale	1
	Well designed	2		
	Features of digital version	2		
	Free	1		
Commercial Section n = 13	Helpful for course content	5	Flow of content	3
	Clear and direct language	4	Outdated	1
	Good examples	3	Not bound	1
	Color and format	1	No multimedia	1
	Definitions of vocabulary	1		

Table 1 Coded Answers to Open-Ended Questions from Student Survey with the Frequency Mentioned.

STUDENT OUTCOMES

Students assigned the commercial textbook did not differ from students assigned the OER with respect to final course grade in GPA format (commercial $M = 3.26$, $SD = 1.21$; OER $M = 2.93$, $SD = 1.41$), $t(50) = 0.89$, $p = .378$, enrollment intensity the following semester (commercial $M = 7.16$, $SD = 6.44$; OER $M = 7.43$, $SD = 6.13$), $t(53) = -0.16$, $p = .873$, or withdrawal rates (commercial 8%; OER 3.3%), $\chi^2(1) = 0.58$, $p = .448$.

	COMMERCIAL ($n = 25$)	OER ($n = 30$)	t-TEST
Prior GPA	2.97 (0.67)	2.74 (0.78)	$t(44) = 1.07$, $p = .291$
Total Enrolled Credits (Fall 2018)	10.52 (3.70)	11.17 (3.15)	$t(53) = -0.70$, $p = .487$
Prior College Credits	11.20 (18.20)	12.55 (21.93)	$t(53) = -0.25$, $p = .807$
Number of Terms Completed	3.64 (2.27)	4.23 (1.80)	$t(45) = -0.97$, $p = .335$

Table 2 Significance of Student-Level Variables for Commercial and OER Course Sections.

DISCUSSION

This small study utilizes the COUP Framework developed by the Open Education Group (2023) that suggests examining different aspects of cost, outcomes, usage and perceptions when studying the impact of OER and open pedagogy in higher education. Specifically, this study utilizes a quasi-experimental design that explores student course outcomes and student perceptions of their textbook in two sections of the same course – one using a new faculty-created OER and one using the previously assigned commercial textbook. In terms of student perceptions, students rated the quality of the OER to be significantly higher than the commercial textbook, but there was no significant difference in how they rated the usefulness of the two textbooks. In terms of student outcomes, there was no significant difference in student final grades, withdrawal rates or the number of credits they enrolled in the following term.

In examining student outcomes, the use of the new faculty-created OER did not lead to significant differences in student grades, the withdrawal rate, or the number of credits enrolled in the following term. This is consistent with the literature showing same or better student grades with the use of OER (Allen et al., 2015; Cho & Perzmadian, 2024; Clinton, 2018; Colvard et al., 2018; Dempsey, 2021; Medley-Rath, 2018; Tlili et al., 2023; Winitzky-Stephens & Pickavance, 2017) and the same or lower withdrawal rates with the use of OER (Clinton, 2018; Colvard et al., 2018; Delgado et al., 2019; Winitzky-Stephens & Pickavance, 2017). Unlike the literature which shows a positive effect on enrollment intensity the following term (Fisher et al., 2015) or the same term (Clinton-Lisell, 2023) when students use OER, this study found no significant difference in enrollment intensity the following term with the use of OER.

In examining student perceptions of textbook quality, students in the OER section rated their textbook as significantly higher in quality than other textbooks compared to how students in the commercial textbook section rated the quality of their textbook. However, it is unclear how students may have interpreted the concept of quality. There was no significant difference in how students in the two sections rated the usefulness of their respective textbooks for helping them learn the course content and complete the coursework. This was consistent with literature showing that students perceived the quality and usefulness of OER to be the same or above that of commercial textbooks (Hilton, 2020; Kelly et al., 2024; Mullens & Hoffman, 2023; Ryan & Nawalaniec, 2021; Squibb et al., 2023; Wynants & Dennis, 2022).

Student comments about their textbook preferences showed that students in the OER section appreciated that the OER was accessible digitally, directly matched the course content, used simple, clear and direct language, included good examples, was well designed, and that it was free. They also reported disliking the flow of the content, errors, difficult vocabulary and that the textbook was in grayscale rather than color.

Students in the commercial section also reported both benefits and drawbacks to their textbook. They expressed that the textbook was helpful for the course content, used clear and direct language, contained good examples, and they appreciated the use of color and definitions of

vocabulary. They disliked the flow of the content, that it was outdated, that it wasn't bound, and that it did not include multimedia.

Areas of overlap for both textbooks included that students in both sections liked clear, direct language and good examples, and disliked the flow of the content. These findings are consistent with the literature showing that students liked the digital features of the OER allowing for increased access, that their OER contained relevant, updated content, was customized for the course, explained topics clearly, and that it was free (Hendricks et al., 2017; Jhangiani et al., 2018; Ryan & Nawalaniec, 2021; Squibb et al., 2023; Wynants & Dennis, 2022). Negative comments were also consistent with the literature showing that students generally disliked low quality visuals, lack of visuals, formatting issues, and errors in their OER (Hendricks et al., 2017; Wynants & Dennis, 2022).

The student population at this community college was composed of slightly less than 25% students of color, around 17% first generation college students, 43% part-time undergraduate students, and slightly less than 35% who were unable to meet college expenses with their expected resources (Oregon Higher Education Coordinating Commission, n.d.). Thus, textbook costs were likely important to this student population (Hardin et al., 2019; Jenkins et al., 2020). While there were not significant differences in student outcomes related to the use of OER or the commercial textbook, this may be, in part, due to the work that the library and bookstore had previously done to mitigate the high cost of the print commercial textbook by providing a reserve copy in the library and by offering a low cost ebook alternative.

The faculty's motivations for creating this textbook were to reduce the cost barrier for their students and to design a textbook that was customized to their specific course and the needs of their students. They designed it specifically to be understandable for their students, to include updated examples and case studies, and to support the learning outcomes of the course. While this did not result in a difference in student outcomes or in how students rated the usefulness of the textbook, it may be related to the reason students rated the OER as significantly higher quality than the commercial textbook. Since we did not utilize a framework or specific definition of quality in the survey for students, we can only hypothesize from their open-ended responses why they selected this rating. Two of the three most common open-ended responses about what students liked about the OER textbook were that it directly matched the course content and used simple, clear and direct language, while a smaller number of responses stated that the OER had good examples. It seems likely that the faculty's efforts to create their textbook to match their course, using updated examples, and with language that was easier for their students to understand, attributed to students' perceptions of the OER's quality as suggested by Levy and Tila (2022). The students knew that the faculty member had designed the textbook specifically for them to save them money and to better support their learning. This may have contributed to their sense of connection with the faculty because they could see that the faculty cared about them as learners. While this connection could have biased student perceptions of the quality of the OER, it may have also created a positive learning environment for students since trust, care and emotional connection are important for effective learning (Hegarty, 2015; Levy & Tila, 2022). For underserved student populations, trust, emotional connection and care are especially important (Lin & Kennette, 2021). Not only did students see that the faculty cared about them by creating this textbook for them, but the faculty also invited their feedback during the term to improve it, and students did report many suggestions for improvement to the faculty and librarian. This likely gave students a sense of ownership or sense of community, and at the very least demonstrated that the faculty valued their ideas and input (Hegarty, 2015; Levy & Tila, 2022).

One finding was that negative comments about the OER did not include issues with its digital nature, while the positive comments highlighted that they liked that it was accessible digitally. The digital aspects of OER may pose issues for underserved students affected by the digital divide, specifically with limited access to reliable internet and technology, and low comfortability with the use of technology (Dempsey, 2021). However, the faculty, librarian, and bookstore were very aware that digital access to the OER would likely pose challenges for their student population, and so worked to mitigate those issues ahead of time. They provided affordable print versions of the OER in the bookstore for sale, which sold out, and provided a print copy of the OER on reserve at the library, which was checked out by students six times that semester. The librarian

reported that other students chose to print the textbook themselves. From this, we can see that these students really did find a print version to be important even when the digital version was available to them. In addition, the librarian came to the class at the beginning of the term to teach students how to access and navigate the OER textbook and was available during the term to support students with additional questions. All of these efforts likely contributed to both the student comments that they liked the digital accessibility of the textbook and the lack of negative comments related to aspects of the digital version.

Faculty creation, remixing and use of OER benefits from community and institutional support (Farrow et al., 2024, Van Allen & Katz, 2020). In this case, institutional support came from the library, which provided grants for the faculty to create the OER and revise it the following summer based upon student input. The accessibility department supported the faculty during the OER creation process to ensure that the textbook met accessibility standards. The OER librarian supported the faculty with project guidelines, campus OER textbook adoption procedures, editing, copyright, format and access options, archiving the textbook in an institutional repository, and adding it to OER Commons. The bookstore was instrumental in providing print versions of the OER for sale to students. The larger OER community in Oregon, fostered in large part by Open Oregon Educational Resources, as well as the international OER community, also indirectly provided support for this project through education and best practices available to the library and faculty who worked on this project.

This open textbook is also an example of how an OER can be created and shared in a sustainable manner to support future updates and contextualization for local contexts (Pitt, 2023). It was uploaded to an institutional repository and added to OER Commons in both Word and PDF formats for easy access and availability for future editors. Additionally, the case studies were included as an appendix to the textbook so that they could be quickly and easily updated.

LIMITATIONS

The results of this study may not be generalizable in other settings because it was limited to two sections of a single course with a small sample size. While the findings demonstrate correlation, they cannot demonstrate causality between the use of the OER or commercial textbook and student outcomes or perceptions. The faculty was asked to randomly assign each section either the OER or the commercial textbook, but to fully reduce bias, the textbooks could have instead been assigned randomly by the investigators. Additionally, students self-selected into each of the two course sections upon enrollment, so there may have been differences in the groups of students who self-selected for the different times that the courses were offered. Though the study controlled for many student and course-level variables, it did not control for student-level variables such as socioeconomic status, race and ethnicity, and first language, nor did it investigate how these variables intersect. While larger studies are able to disaggregate data (e.g., Colvard et al., 2018 and Dempsey, 2021), that was not possible in this case due to small sample sizes resulting from the unique study design. The writing assignments were the same in each section, but the questions on the quizzes and exams were different in order to accommodate for differences in the commercial and OER textbooks, which may have affected the results. Because the survey relies on students' self-reported perceptions of the quality and usefulness of their textbooks, and their open-ended comments about their likes and dislikes of their respective textbooks, the survey results may include bias. A definition of textbook quality was not provided to the students nor was a framework for defining textbook quality used in the survey instrument, so it is unclear how to interpret the findings related to the global question of textbook quality.

DIRECTIONS FOR FUTURE RESEARCH

Further studies that build upon Colvard et al.'s (2018) study, which looked at how the use of OER specifically affected students with varied socioeconomic status, race, and ethnicity, and part-time or full time status, would be useful in working toward equity in higher education. Lambert's (2018) proposed definition of open education would be a valuable tool for studies that intentionally center how OER affects students in terms of redistributive justice, recognitive justice, and representational justice. Studies on how faculty change their teaching approach when going through the OER design and creation process would be useful for other faculty and staff who provide OER support services, and administrators

looking to implement processes to support OER adoption. Finally, studies measuring holistic course redesign, including employing quality OER, meaningful Open Educational Practices (OEP), and a tailored instructional approach with consideration of learners' individual factors as described by Tlili et al. (2023) would be helpful to measure and work toward increases in learning achievement.

CONCLUSION

This business law OER textbook was designed and created by the faculty to match their course outcomes, be understandable to their students, include updated examples, include an appendix of case studies which could be easily updated in the future, and offer multiple formats for access. This enabled students to save money on course materials without negatively affecting their course outcomes. Students in the OER section perceived the quality of their textbook to be significantly higher than students in the commercial section, and found it to be just as useful as a traditional textbook.

Creating OER is an ongoing process which requires collaboration and support – from utilizing open licenses, ensuring content is accessible, making multiple formats available to students, and teaching students how to use the textbook, to receiving feedback and making revisions. This example shows how OER creation and adoption can be done successfully in a way that saves students money, allows them to succeed, and provides them with quality, relevant course material customized for their course outcomes. It also highlights how the use of OER can provide opportunities for faculty to engage in open pedagogy by working together with their students to improve learning materials and encourage participation in knowledge creation.

DATA ACCESSIBILITY STATEMENT

The datasets generated and/or analyzed during the current study are available in Pacific University's institutional repository, CommonKnowledge, at <https://commons.pacificu.edu/work/ns/829a2ba9-3dc9-481c-abc9-41d363b0be09>.

SUSTAINABLE DEVELOPMENT GOALS (SDGs)

This study is linked to the following SDG(s): Quality education (SDG 4) and Reduced inequalities (SDG 10).

ETHICS AND CONSENT

The proposal for this project and all materials including the student survey and informed consent form were reviewed and approved by the college's office of institutional research and administration before the study began since the college did not have an institutional review board (IRB). After the study took place but before submission of this manuscript for publication, this study was also filed with Pacific University's IRB since the authors had become affiliated with Pacific University during that time period.

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AUTHOR CONTRIBUTIONS (CRediT)

Jennifer Lantrip: Conceptualization, data curation, formal analysis, funding acquisition, investigation, methodology, project administration, resources, validation, visualization, writing – original draft, writing – review & editing; Meagan Button: writing – original draft, writing – review & editing. All authors have read and agreed to the published version of the manuscript.

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