Evidence Based Library and Information Practice

Research Article

Beyond Cost Savings: The Impact of Open Textbooks on Writing Studies Course Grades

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Abstract

Objective – This study was designed to explore the potential academic impact of open textbooks in writing courses.

Methods – The researcher used statistical analyses of course outcomes for over 1,000 sections to examine the impact of OER usage on course GPA in three writing courses at an R1 university.

Results – Study results reveal that using an OER textbook is associated with an overall increase in class GPA.

Conclusion – When advocating for the use of OER in campus writing courses, librarians can point to findings that suggest improved student outcomes after a switch to OER in those courses.

Introduction

The cost of higher education is a barrier for many students. Recent statistics suggest that the average cost of attendance at a US four-year public institution is $26,000/year (National Center for Education Statistics, 2023a). The rising cost of education is reflected in the amount of debt that students take on; on average, US students who take out loans are borrowing over $45,000 to complete their undergraduate degrees (National Center for Education Statistics, 2023b). These high costs are leading more and more students and families to question the value of a college education (Tough, 2023).

Librarians and individual faculty members may feel powerless to impact the cost problem in higher education. However, faculty and departments typically have control over one important cost in higher education: textbooks. Full-time college students in the US typically spend between $1,240 and $1,460 per year on books and supplies (Ma & Pender, 2022). Textbook costs can be particularly challenging for students because they are difficult to predict (Colvard et al., 2018). Students often don't know until they see the syllabus if they can get their books through the library or if they will have to purchase the most recent anthology or specific editions of a dozen novels. Similarly, they may not find out until the first day of classes that they are expected to purchase a textbook, supplementary writing guide, and access to a peer review site or an artificial intelligence (AI) writing resource.

Expensive textbooks can impact not only a student's financial situation, but also their academic success. Without a textbook, students are impeded in their efforts to learn the course content. Despite the potential impact on their course grade, students commonly postpone or even forgo purchasing course materials in order to save money on textbooks (Florida Virtual Campus, 2022; Murphy & Shelley, 2020). Further, research suggests that the cost of textbooks can impact the number of courses a student takes per semester; students who take classes with open textbooks are likely to enroll in more courses (Fischer et al., 2015).

Open Educational Resources (OER) are an increasingly popular solution to the cost of textbooks. Open textbooks, unlike commercial textbooks, are licensed for free use, sharing, and modification, meaning that there is no cost to either faculty or students when using an open textbook for a course. Although open textbooks eliminate cost barriers for students, faculty may be reluctant to change to OER due to concerns about quality and potential impact on student performance. In order to allay these concerns, researchers have been examining the impact of OER on student academic performance. Scholars have published a number of studies investigating the impact of OER on student learning in math, psychology, the health sciences, and a variety of other disciplines (Grewe & Davis, 2017; Magro, J., & Tabaei, S. V., 2020; Riley & Carmack, 2020; Winitzky-Stephens & Pickavance, 2017). However, little research has examined the impact of OER on student performance in writing and composition courses. This study contributes to filling that gap by examining differences in course GPA for three writing courses at a large R1 university. The research question this study aims to answer is as follows: What is the relationship between the use of open textbooks in writing courses and student academic performance?

Literature Review

Although OER can have multiple positive impacts, much of the nascent OER discourse has focused on affordability and removal of cost barriers. Library and campus affordability initiatives have, for logical reasons, particularly emphasized high-enrollment courses with expensive textbooks (Soper et al., 2018; Spilovoy et al., 2020; Wesolek et al., 2018). By switching to OER in one of these courses, students can save hundreds of thousands of dollars in a single academic year. For this reason, this type of course is

commonly referred to as low-hanging fruit by affordability advocates (Contrada & Good-Schiff, 2021; Walsh, 2020; Wesolek et al., 2018).

Because of the OER movement's focus on dollars saved, affordability efforts have been slow to target writing studies. Unlike lower-division STEM courses, which can enroll hundreds of students in a single lecture, writing studies courses tend to have low enrollment caps. Further, composition and writing textbooks tend to be moderately priced. For example, the most recent paperback edition of the commonly used composition textbook *Everyone's an Author* has a publisher list price of $63.75 (W.W. Norton, 2023).

Although writing studies may not be a first target for affordability initiatives, many writing instructors have embraced OER as a strategy to save students money, as evidenced by the number of open textbooks that have been created in this discipline. The Open Textbook Library (2023), a well-known repository for open textbooks, included 115 OER in their Literature, Rhetoric, and Poetry section covering composition, technical writing, and American and world literature as of December 2023. For comparison, the same repository included 40 textbooks for Physics, 49 for History, and 45 in Psychology at that same time period. The vast disparity illustrates the level of engagement that English and Writing instructors have had in this area.

OER and Writing Courses

As more and more writing instructors have experimented with OER in their classrooms, several of them have reported on their experiences. For example, Hutchins (2020) detailed her journey to using OER in her reading and writing and composition courses, including tips on everything from finding OER readings to publication platforms. Similarly, Jory (2020) explained how Salt Lake Community College developed an entire series of OER texts aligned with their threshold concept-based curriculum. Vengadasalam (2020) described three different models for incorporating OER into technical writing courses, including using OER as a supplement to traditional commercial resources, using OER as a course textbook for a single course, and making a campus-wide shift to OER. Each of these authors provides insights to fellow instructors who may be interested in trying OER at their own institutions.

Researchers have also investigated how faculty and students perceive open textbooks. Studies have found that both students and faculty reported positive perceptions of their open writing textbooks (Branson et al., 2021; Zuhaila and Triana, 2023). Branson et al. (2021) found that 80% of students considered their open textbook as higher quality than commercial textbooks, and 86% found it more useful. Similarly, Zuhaila & Triana (2023) found that most of their English as a Foreign Language students "had a positive perception toward the use of OER in improving students' writing skills" (p. 189). In terms of faculty, Branson et al. (2021) found that 100% of instructors surveyed found the OER helpful.

In addition to positive perceptions, authors have also discussed the side benefits they uncovered when working with OER. Branson et al. (2021) explained that "Our program is much more unified in what we teach, how we teach, and the assignments we use" than they were before they collaborated to develop OER (p. 201). By coming together to develop OER learning materials, the writing program faculty became more aligned in their pedagogical goals and methods. Similarly, Jory (2020) found that "the curricular and pedagogical endeavor has forced us to carefully consider who our students are, where they come from, and how we can draw on our best disciplinary knowledge to support their development as writers"

(386). The actual process of developing OER had a positive impact on the faculty's intentionality in designing the curriculum.

Faculty Concerns about Quality

When examining faculty textbook choices in a variety of disciplines, researchers found that quality is typically the primary consideration (Martin & Kimmons, 2020; Scott et al., 2023; Spilovoy et al., 2020). Faculty want to be sure that the textbooks that they've chosen have accurate content, contain quality images and graphics, and are appropriate for their pedagogical approach (Jung et al., 2017; Martin & Kimmons, 2020). Many faculty want textbooks that include robust ancillary materials such as lecture slides, test banks, and homework sites (Elder, 2022).

Concerns about textbook quality are intertwined with concerns about student learning; faculty are concerned that changing textbooks could impact student performance. Fortunately, researchers have found that students typically perform as well, if not better, in classes using an open textbook. Studies examining the relationship between OER and student performance have found gains in classes using OER in disciplines such as history, psychology, and nursing (Grewe & Davis, 2017; Magro & Tabaei, 2020; Riley & Carmack, 2020). Other studies have found that there is no significant difference between student performance in OER and non-OER sections of courses such as math and biology (Winitzky-Stephens & Pickavance, 2017). This pattern extends across a variety of institution types and disciplines; in a synthesis of 16 published studies of OER efficacy, Hilton found that students using OER often outperformed their peers using commercial textbooks (2020, p. 869).

Amid the growing body of literature examining the impact of OER on student academic performance, there is limited scholarship on student performance in OER writing courses. In one notable exception, Griswold's (2022) study of community college composition students found no significant differences in student performance after switching to an open textbook. Following in the footsteps of Griswold's work, this study examines course-level student outcomes in OER and non-OER sections of three common writing studies courses.

Methodology

The data set used was derived from pre-existing data published on the website of an R1 university. The website publishes course outcomes, in aggregate and with no personally identifiable information, for all university courses that meet minimum enrollment criteria (due to privacy concerns). In addition, the university's publicly-available course scheduler includes an indicator marking which courses are using only OER. After receiving a determination from the researcher's Institutional Review Board that this study was not considered human subjects research, the researcher used the course scheduler to extract a list of sections for three courses of interest: Composition, Technical Writing, and Introduction to Literature. These courses comprise three large multi-section offerings within the university's writing program. Each section included an indicator if they were using only OER. To this data set, the researcher added the course outcomes (course grade point average) for each section. The overall data set included 1,043 course records dating back to 2019, when the department's first OER was implemented for Composition. The data set includes four variables which are detailed in Table 1 below.

Table 1
Variables

Variable Name	Variable Type
OER	Categorical
Course Number	Categorical
GPA	Continuous
Instructor	String

This study used multiple regression to examine the impact of OER usage on course GPA in the three writing courses. Because instructors were commonly assigned to teach multiple sections of the same course, either in the same semester or in different semesters, the researcher used a clustered regression. This method was used to account for correlation between course sections by the same instructor. In addition, the study used t-tests to examine differences in course GPA between OER and non-OER sections of the same course.

Assumptions Checking

Because this study employed ordinary least squares (OLS) regression, the researcher first checked that the assumptions of OLS were met. Density and QQ plots visually confirmed that the distribution was approximately normal; however, the Breusch-Pagan test for heteroskedasticity revealed that the data set had problems with homoskedasticity, thus violating the constant residual variance assumption.

Next, the researcher examined the data for outliers, running leverage, studentized residuals, Cook's D, and dfbetas tests to identify outliers influencing the dependent variable. Tests revealed that 24 observations met the criteria for high values for all four outlets tests. These 24 outliers were removed from the sample and OLS assumptions were re-checked. After removal of the 24 outliers, the data set met the constant residual variance assumption (Table 2).

Table 2
Breusch-Pagan Test Results

	Chi Square Distribution $\chi^2(1)$	*p*
Including Outliers	12.21	0.0005
Excluding Outliers	0.00	0.9568

Descriptive Statistics

After outliers were removed, the data set contained information from 1,019 course sections: 501 sections with open textbooks and 518 sections with commercial textbooks. A summary of the course sections is available in Table 3.

Table 3
Descriptive Statistics

	Variable	Observations	Proportion
OER	Composition	160	.32
	Technical Writing	329	.66
	Introduction to Literature	12	.02
Non-OER	Composition	75	.14
	Technical Writing	254	.49
	Introduction to Literature	189	.36

Results

Regression Results

Regression results, detailed in Table 4, revealed that this model accounts for 11% of the variation in course GPA, $F(3, 116) =15.64$, $p<0.001$. Partial η^2 for OER and course number were .036 and .082, respectively. Although this indicates that the effect sizes for each predictor were small, the regression results reveal that, holding course number constant, there was a statistically significant difference between OER and non-OER courses. Switching from a commercial textbook to an OER is associated with a .120 point increase in course GPA, $t(116) = 3.79$, $p<0.001$.

When controlling for the type of textbook used, there were also significant differences in GPA between the three different courses. Introduction to Literature had a mean course GPA that was .154 points higher than that of Composition, the reference group, $t(116) = 3.66$, $p<0.001$. Similarly, Technical Writing's course mean GPA was .207 points higher than Composition, $t(116)=5.71$, $p<0.001$.

Table 4
Regression Results

Predictors	Robust Standard Error	t	p
OER			
OER	.120 (.032)	3.79	<.001
Non-OER (reference group)			
Course Number			
Composition (reference group)			
Introduction to Literature	.154(.042)	3.66	<.001
Technical Writing	.206(.036)	5.71	<.001

T-Test

T-test results revealed that there were significant differences in course GPA for Composition courses with and without open textbooks (Table 5). In Composition, the mean GPA for OER sections was 0.198 points higher than that of courses without open textbooks, $t(233)=-3.39$, $p<.001$. For Technical Writing, the mean GPA for OER sections was 0.12 points higher, $t(581)=-5.06$, $p<0.001$. For Introduction to Literature, there were no significant differences in GPA between OER and non-OER sections. The mean GPA for OER sections was 0.06 points higher than that of non-OER sections, $t(199)=-.79$, $p=0.43$.

Table 5
T-Test Results

	Variable	Mean	Standard Deviation	Standard Error	p
OER	Composition	3.505	.284	.022	<.001
Non-OER	Composition	3.373	.265	.031	
OER	Technical Writing	3.708	.270	.015	<.001
Non-OER	Technical Writing	3.588	.299	.019	
OER	Introduction to Literature	3.603	.341	.098	=0.430
Non-OER	Introduction to Literature	3.539	.268	.019	

Discussion

This study's results indicate that there is a correlation between student academic performance and faculty use of open textbooks in writing courses, which supports the hypothesis that faculty use of OER can support student academic achievement. Specifically, results indicate that course GPA is estimated to be .120 points higher in writing courses using an OER. Analysis of student performance in each of the three courses reveals that, in all three courses, students in sections using an open textbook achieved a higher average GPA compared with those in sections using a commercial textbook. In two of these courses, Composition and Technical Writing, the increase was statistically significant. The third course, Introduction to Literature, showed a small but statistically insignificant difference in course GPA for sections using open textbooks. These findings align with previous research that suggested switching to open textbooks is not likely to negatively impact student academic performance, and in many cases is associated with an improvement in performance (Hilton, 2016).

There could be multiple reasons for higher student grades in OER sections of writing courses. One reason could be improved access to the course materials. Many students choose to delay or even forgo purchase of course materials, either due to financial limitations or because they are unsure that those materials will be truly needed (or both). By switching to an OER, faculty are providing all of their students with immediate access to required learning materials. In addition, for classes that switched to open textbooks prior to the pandemic, students in those sections may have benefited from seamless access to their course materials when the pandemic caused the university to shift to virtual learning.

A second reason for improved student performance could be due to faculty curricular revisions. Switching to a new textbook can be an opportunity to reconsider course design and try new strategies to enhance student learning and engagement. If faculty update their curricula while adopting an OER, student performance may be connected to the curricular changes in addition to, or even instead of, the change in textbook.

A third reason could be increased alignment between learning materials and course outcomes. Open textbooks, by definition, can be modified by instructors, and research indicates that many instructors take advantage of this feature (Weller et al., 2015). Faculty can use this affordance of OER to increase the relevance of the learning materials to their students. The process of adapting a textbook can make a faculty member more intimately familiar with the textbook content and enable them to be more intentional about how they use the textbook in the course.

It is also possible that tailoring course materials could make the textbook seem more relevant and useful for students, thus making them more likely to engage with those materials. For example, the authors of the open textbook for Technical Writing designed chapters that would support specific assignments, such as the writing of a résumé. The close alignment between the chapter content and the assignment could have influenced student perceptions of the textbook's usefulness, and thus their engagement with the content.

Finally, it is impossible to rule out the possibility that the differences in course GPA are due to reasons unrelated to the textbook used. Students were not randomly assigned to each course and instructors had the ability to choose which textbook they wanted to use. Further, although sections of the same course

shared learning outcomes, instructors had the academic freedom to design their own curriculum and assignments. The researcher was not able to control for these curricular differences in this study.

This study does not specify which of these reasons, or others, explains the difference in student academic performance between course sections using OER and commercial textbooks. Future research should explore these possibilities.

Implications for Practice

When librarians are considering courses to target for OER efforts, writing courses, due to the moderate cost of textbooks in the discipline, may not be considered low-hanging fruit in efforts to save students money on textbooks. However, writing studies faculty have been actively engaged in the open movement, and the open textbooks those faculty have developed are being used by thousands of students nationwide, suggesting that writing studies faculty may be highly receptive to conversations about OER. Librarians considering approaching faculty who teach writing courses such as composition, technical writing, and introduction to literature courses should consider perusing OER repositories such as the Open Textbook Library or George Mason University OER MetaFinder to determine whether there are existing open textbooks that might meet or be easily adapted to meet their faculty's curricular needs.

Librarians who find that their writing studies faculty are hesitant about switching to an open textbook due to concerns about quality should note that this research, together with numerous previous studies, supports the notion that using an open textbook does not have a negative impact on student academic performance. On the contrary, research suggests that students are likely to perform better when using an open textbook. Hilton asked, "If the average college student spends approximately $1000 per year on textbooks and yet performs scholastically no better than the student who utilizes free OER, what exactly is being purchased with that $1000?" (2016, p. 588). Given the number of well-reviewed OER available for composition, technical writing, and introductory literature courses, this study's results support the validity of this question. Librarians advocating for faculty adoption of OER in writing courses may wish to encourage faculty to consider what value is being added to their course by using commercial materials.

Limitations

This study was based on existing data from a single R1 institution and cannot be generalized to other types of institution. Further, this study was based on course-level student outcomes; it did not include student-level data, including demographic characteristics such as socioeconomic status that could also influence student course outcomes. In addition, it is possible that there were other reasons, such as differences in instructor, course assignments, or instructional content, that could have contributed to changes in student academic performance. Finally, this study was based upon OER information provided in a self-report course marking system. The course indicator suggested that a section is using only OER, including open textbooks and other open resources. However, it was possible that some sections may have used a combination of resource types.

Conclusion

This study examined the academic outcomes of students enrolled in three writing courses at an R1 university. Specifically, the study examined if there was a difference in course grades for students enrolled in sections using open textbooks compared with those using commercial textbooks. Study results indicated that students in sections using an open textbook achieved a higher average GPA compared

with those in sections using a commercial textbook. This finding reinforces previous findings in the literature that suggest faculty use of open textbooks supports student academic achievement.

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