Access Is Not Enough: An Examination of OER Textbook Usage by English Composition Students at One Community College

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More community college professors are replacing expensive commercial textbooks with no-cost open educational resources (OER) to help make college more affordable for their students. With students having no financial reason to delay or forgo textbook purchases, many instructors also expect OER adoption will lead to improvements in academic outcomes because all students have free and open access to the textbook. In their 2019 article, Grimaldi et al. have termed this idea the access hypothesis. Although a very plausible theory, why have most researchers found that OER adoption has no significant influence on student learning outcomes? This study examined OER textbook usage by English composition students at one community college and found a simple answer to this question: access to an OER textbook will not affect academic outcomes if students are not using the textbook. Based on these findings, open pedagogy offers community college educators a promising implication for practice and future study.
   Keywords: open educational resources, community college students, open pedagogy

With rising textbook costs adding to the financial barriers that prevent many community college students from achieving their higher education goals (Hicks et al., 2014; Hollifield-Hoyle & Hammons, 2015), more faculty members are replacing expensive commercial textbooks with open educational resources (OER) to make college more affordable for their students (Grimaldi et al., 2019). OER are defined as "teaching, learning, and research resources that reside in the public domain or have been released under an intellectual property license that permits their free use and re-purposing by others" (Fischer et al., 2015, p. 160). Because surveys indicate that students often forgo purchasing required textbooks to save money (Hilton, 2016; Lumpkin, 2020), it also follows that OER adoption should improve academic outcomes by giving all students free and open access to course materials. Grimaldi et al. (2019) have termed this the access hypothesis. To date, however, most researchers have failed to detect any significant association between OER adoption and student success outcomes such as course grade, retention, and GPA (Grimaldi et

al., 2019; Hilton, 2016). This study measured student use of a free online textbook in English composition classes at Nashua Community College (NCC) to provide additional insight into the limitations of the access hypothesis.

Literature Review

During the period between 2006 and 2016, the U.S. Bureau of Labor Statistics reported that textbook costs grew by 88% (Lumpkin, 2020). This trend has placed an additional financial burden on students already coping with rising tuition rates at the nation's public colleges and universities (Huelsman, 2018). The high cost of college attendance is especially problematic for community college students. Because community colleges offer an affordable pathway to higher education, they tend to serve a higher percentage of low-income students as compared to four-year institutions (Hicks et al., 2014). This demographic is much more sensitive to rising education costs than their wealthier peers (Fischer et al., 2015), and as a result, financial barriers can play a considerable role in negatively influencing the retention rates of community college students (Hicks et al., 2014; Hollifield-Hoyle & Hammons, 2015). As a strategy to reduce financial barriers, more faculty members are turning to OER as an alternative to commercial textbooks (Grimaldi et al., 2019).

In terms of benefits, the adoption of free or low-cost textbooks clearly saves students money. OpenStax, a prominent developer of OER materials, estimated those student savings have totaled $500 million since 2012 (Grimaldi et al., 2019). Further, evidence suggests there is no difference in the quality of OER materials compared to commercially produced textbooks (Bliss et al., 2013; Fischer et al., 2015). This is an important benefit for faculty that could help explain the growing interest in OER adoption (Grimaldi et al., 2019). According to a survey of 573 faculty members from a large university, an overwhelming 90% of respondents would be willing to replace their existing textbook if the OER materials were the same quality as their current textbook (Martin et al., 2017). Some researchers have also suggested there may be academic benefits associated with OER adoption (Fischer et al., 2015; Hilton & Laman, 2012; Pawlyshyn et al., 2013). In one example, researchers found that Houston Community College students who used an OER psychology textbook outperformed students using a traditional textbook based on three measures: course GPA, attrition rates, and scores on a standardized psychology exam (Hilton & Laman, 2012). One possible explanation for these encouraging findings is that OER removes financial barriers and makes course materials accessible for all students.

Despite the high prices, college faculty members continue to rely on textbooks as an important tool for sharing course content with their students (Martin et al., 2017). Unfortunately, students often forego buying textbooks to save money (Lumpkin, 2020). A 2012 survey of 22,129 Florida college students indicated that 64% of students chose not to purchase a required textbook due to high cost (Hilton, 2016). It follows that students who lack access to required course materials would be at a serious academic disadvantage when compared to their peers who purchased the textbook. OER adoption addresses this issue by providing all students with free access to course materials. Once all students can use the textbook, there should be corresponding gains in students' academic achievement. Grimaldi et al. (2019) call this theoretical association between OER adoption and improved academic outcomes the access hypothesis. To date, however, there is little evidence to validate the access hypothesis. A comparison of nine different research studies by Hilton (2016) revealed inconsistent findings and significant limitations. Further, Grimaldi et al. (2019) observed that "the majority of comparisons in the literature find null effects of OER adoption on learning outcomes" (p. 2).

Why have most researchers failed to find a significant positive association between OER adoption and academic achievement? In their 2019 article, Grimaldi et al. employed simulation analysis to identify important limitations in the standard research methods used to examine the effects of OER adoption. They also suggested a much simpler explanation: "access is not a guarantee for learning" (p. 10). In other words, if students choose not to use the OER textbook, then it will not influence academic outcomes. This explanation is very plausible when placed within the context of studies tracking patterns of student textbook usage (Baier et al., 2011; Berry et al., 2010; Gorzycki et al., 2019; Stratton, 2011). Although college students recognize the value of the textbook as a learning tool (Berry et al., 2010; Gorzycki et al., 2019), many students spend little time completing reading assignments (Baier et al., 2011; Berry et al., 2010; Gorzycki et al., 2019). In their survey of 395 students enrolled in two Midwestern universities, Baier et al. (2011) found that 62% of students spent one hour or less reading each assignment. Stratton (2011) found similar results in a survey of 84 community college students who reported they only completed an average of 54% of the required textbook readings before a test. It is interesting to note that each of these studies relied upon student survey data or open responses. It is possible students may have self-reported higher levels of textbook usage when the actual amount of time students spent completing reading assignments was much lower.

The growing popularity of online textbooks provides researchers with an opportunity to gather more accurate data on student textbook usage.

The purpose of this study was to further explore the access hypothesis by comparing the academic outcomes of ENGL 101N students who had access to the OER textbook (fall 2019 cohort) with ENGL 101N students who used the commercial textbook (fall 2018 cohort). Because students could only access the OER textbook through Canvas,[1] the researcher also used Canvas data to get an accurate measure of students' usage of the OER textbook. The researcher hypothesized that low student utilization of OER learning materials could be an important limitation of the access hypothesis. Two research questions guided this study:

RQ1: To what extent was OER adoption associated with improved academic success of students enrolled in ENGL 101N at NCC in fall 2019, compared to outcomes for students in the same course in fall 2018?

RQ2: To what extent did ENGL 101N students use OER learning materials on a regular basis?

Methods

The study took place at NCC between August and December 2019. NCC is one of seven community colleges within the Community College System of New Hampshire. A comprehensive community college located in Nashua, New Hampshire, NCC offers 33 associate degrees and 21 certificate programs. Total enrollment in 2020–2021 was 1,984 students (Nashua Community College, 2022). Since 2015, the college has been involved in the Guided Pathways to Success Initiative (GPS)—a multipronged program to raise students' retention and completion rates. GPS features specific strategies such as corequisite remediation to allow developmental mathematics and English students to participate in college-level coursework; structured scheduling to reduce course schedule conflicts that prevent students from graduating on time; and proactive advising to encourage students to take 12 or more credits each semester to maintain their full-time status. Most recently, NCC faculty members have embraced OER adoption as another strategy to increase retention rates by lowering textbook costs and reducing financial barriers for students.

In fall 2019, 10 English instructors replaced the commercial textbook used in all 18 sections of ENGL 101N with a no-cost, OER textbook[2] available on Canvas. The selection of ENGL 101N was significant be-

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[1] Canvas is the learning management system used by NCC.
[2] Four members of NCC's English faculty (one full-time and three part-time) created the OER textbook for ENGL 101N during the 2018-19 academic year.

cause this is a first-semester, general education course required by all degree programs at NCC. By adopting an OER textbook in ENGL 101N, faculty members hoped to bring cost savings to the majority of NCC students. Further, faculty members expected to see an improvement in success measures for students enrolled in ENGL 101N because all students would have free access to the OER textbook. It is important to note here that all ENGL 101N faculty at NCC use a common syllabus and share many of the same learning activities. Although the faculty adopted a new OER textbook in fall 2019, they largely employed the same teaching methods used with the commercial textbook in fall 2018.

Using a quasi-experimental design (Shadish, Cook, & Campbell, 2002), the researcher set out to examine the academic outcomes of ENGL 101N students who had access to the OER textbook in fall 2019 (treatment group) as compared to ENGL 101N students who used the commercial textbook in fall 2018[3] (control group). The treatment group consisted of 211 students enrolled in 18 sections of ENGL 101N. There were 222 students in the control group. All student participants were at least 18 years of age, first-time freshmen, and matriculated into an NCC program. The researcher used data stored in Banner, the college's student information system, to compare the demographic characteristics of the treatment and control groups (see Table 1). To ensure the groups were similar enough to proceed with a quasi-experimental study, the researcher used an ANOVA test to establish baseline equivalencies. Results showed no statistically significant differences between the treatment and control groups based on students' gender, race/ethnicity, age, college readiness, or socioeconomic status. There was, however, a significant difference between the treatment and control groups in fall enrollment intensity with the fall 2019 cohort having a higher percentage of full-time students as compared to the fall 2018 cohort. Although it was appropriate for the researcher to continue with a quasi-experimental study to identify possible associations between OER adoption and academic outcomes, it was necessary to use regression analysis to control for the difference in fall credit hours noted between the treatment and control groups.

Because students in the treatment group accessed the OER textbook through Canvas, the researcher analyzed Canvas reports to measure students' usage of the OER textbook. It is important to note that each of the 18 sections of ENGL 101N in fall 2019 had a separate Canvas course site. All instructors followed the same format when constructing their Canvas courses. Within each site, students had access to different resources such

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[3] In fall 2018, the NCC bookstore's website listed a typical freshman's textbook costs at over $500 for one semester.

Table 1. *Comparison of Fall 2018 (Control) and Fall 2019 (Treatment) Cohorts of English Composition Students at Nashua Community College*

Term	Total	Gender		Ethnicity/race		Age in years		Corequisite remediation		Enrollment[b]		Pell recipient	
		Male	Female	White	Non-White[a]	18–25	≥26	Yes	No	Full time	Part time	Yes	No
Fall 2018													
Count	222	121	101	163	59	211	11	37	185	141	81	88	134
%	100	54.5	45.4	73.4	26.6	95.0	5.0	16.7	83.3	63.5	36.5	39.6	60.4
Fall 2019													
Count	211	121	90	153	58	198	13	46	165	152	59	73	138
%	100	57.3	42.7	72.5	27.5	93.8	6.2	21.8	78.2	72.0	28.0	34.6	65.4

Note. With regard to corequisite remediation, Nashua Community College implemented a new placement test (NextGen Accuplacer) and new placement scores starting in January 2019. It is possible the increase in the percentage of corequisite remediation students for fall 2019 may be directly related to the new placement scores.

[a] Includes those who did not self-identify their ethnicity/race. [b] Based on federal financial aid guidelines, full-time students are those enrolled in 12 or more credit hours per semester.

as instructor announcements, assignments, weekly modules, and grades. The OER textbook was one of the resources available on each Canvas course home page and readily accessible to students by clicking on the "textbook" tab. The actual OER textbook appeared as a PDF document with a collection of clickable links corresponding to various course topics (see Appendix). All instructors, regardless of modality (e.g., online, face-to-face, or hybrid), utilized Canvas regularly and assigned weekly readings in the OER textbook according to the common syllabus.

The college's Canvas administrator provided the researcher with access to each of the ENGL 101N Canvas course sites in fall 2019. This allowed the researcher to run a series of reports by clicking on the "new analytics" link in each Canvas course. These reports provided useful information about each section of ENGL 101N including weekly online activity, the level of activity per student, and the average course grade. The researcher was particularly interested in evaluating the weekly online activity levels of students in each course section. The Canvas report made it possible not only to monitor the average number of Canvas home page views per student each week in each course section, but also to see which specific resources students were accessing within the course and at what intensity. This included the OER textbook. In this study, the researcher measured *access* to the textbook as the percentage of students in each course section who clicked on the OER textbook tab at least once. The researcher identified two different measures of textbook *usage*: (a) the percentage of total OER textbook page views compared to the total percentage of course page views; and (b) the average number of times each student clicked on the OER textbook tab during the whole course.

Analysis

The researcher utilized Banner data to compare the academic success measures for students enrolled in ENGL 101N in fall 2019 (treatment group) coded 1 with the measures for students enrolled in the same course in fall 2018 (control group) coded 0. With data uploaded to IBM SPSS Statistics, the researcher conducted ANOVA (equivalent to independent sample *t*-tests) to complete the analysis. The researcher chose three indicators to represent the academic success variable: course transferability (i.e., final ENGL 101N grade), fall to spring retention, and GPA. Typically, community college students must earn a grade of C or better in a course if they want to transfer that course to a four-year college or university. As a result, the researcher coded final grade as a dichotomous variable (1 for each student earning a C or better and 0 for those students earning a grade lower than C). In addition, the researcher coded fall to

spring retention as a dichotomous variable (1 for each student registered for spring and 0 for those not registered for spring). The researcher assessed GPA as a continuous variable with each student earning a GPA at the end of the fall semester ranging from 0.0 to 4.0. With these variables in place, the researcher conducted a one-way ANOVA test to look for significant differences in the means between the fall 2019 (treatment) and fall 2018 (control) cohorts. As mentioned earlier, the researcher used regression analysis to control for the difference in fall credit hours noted between the treatment and control groups in this study.

To evaluate students' usage of the OER textbook, the researcher employed descriptive statistics. For each course section, the researcher uploaded Canvas data to SPSS to calculate the percentage of students who viewed the OER textbook page; the percentage of total OER textbook page views versus the total percentage of course page views; and the mean total OER textbook views per student for the whole course. Next, the researcher calculated the median and mean of the total OER textbook views per student for all course sections as well as the range, standard deviation, and variance. The researcher used both median and mean as measures of central tendency to evaluate the possible influence of outliers in the dataset and obtain a more accurate view of students' overall OER textbook usage during the semester (Laerd Statistics, 2018).

Findings

RQ1: To what extent was the intervention associated with improved academic success and subsequent enrollment status of students enrolled in ENGL 101N at NCC in fall 2019, compared to outcomes for students in the same course in fall 2018?

As shown in Table 2, logistic and linear regression analyses found no significant difference in the academic success outcomes of students in the treatment group as compared to the outcomes of students in the control group. Academic success outcomes included ENGL 101N grade (C or better), fall to spring retention, and fall GPA. As a result, there was no evidence to establish any association between OER adoption and the academic success outcomes of ENGL 101N students in fall 2019.

Table 2. *Estimate of Intervention Effects on ENGL 101N Students' Grades, Fall to Spring Retention, and Fall Grade Point Average*

Variable	Intervention		Constant		
	Value	SE	Value	SE	*p*
C or better in English	1.028	0.219	2.017	0.411	0.900
Enrollment in spring semester	1.459	0.242	0.769	0.428	0.119
Fall grade point average	0.164	0.112	1.832	0.214	0.145

Note. N = 433. Because of unmeasured differences between the treatment and comparison groups in the two different years, this analysis cannot lead to strong causal conclusions about the impact of the intervention. Estimates are expressed as odds ratios from logistic regression analyses for the dichotomous variables (C or better and spring enrollment). They are expressed as unstandardized regression coefficients for fall grade point average. Models control for number of credits taken in the fall semester. Although not shown, additional regression analyses were run to control for age, college readiness, gender, race/ethnicity, and socioeconomic status differences between treatment and control groups. No significant differences in program outcomes were noted.

$p < .05$.

RQ2: To what extent did ENGL 101N students use OER learning materials on a regular basis?

Descriptive statistics found a high percentage of ENGL 101N students who accessed the OER textbook during the fall 2019 semester. In fact, 88.9% of ENGL 101N sections had 80% or more enrolled students who viewed the OER textbook page on Canvas (see Table 3). In 10 out of the 18 sections, 100% of students clicked on the OER textbook tab. However, student usage of the OER textbook was very inconsistent across ENGL 101N course sections (see Tables 3 and 4). As shown in Table 3, the textbook page views as a percentage of total course home page views ranged from 1.7% to 51.3%. Because the textbook tab was only one of the resources available on each course section's Canvas home page, it makes sense that students would access the Canvas home page more frequently than the textbook tab. However, the variation by course section is somewhat surprising given that all ENGL 101N instructors followed a common syllabus. Similarly, the total number of textbook page views per student ranged from a low of 1.6 page views in one section to a high of 47.6 page views per student in another section. Although it is likely that format (e.g., face-to-face, online, hybrid, accelerated term) and instructor differences contributed to the variations in student textbook usage across ENGL 101N sections, the overall textbook usage was surprisingly low regardless of these factors. As shown in Table 4, the median number of total textbook views per student was only 22.4 for the whole course. The

mean number was similarly low with only 23.2 total textbook views per student during the semester.

Table 3. *Open Educational Resources Textbook Usage in ENGL 101N Sections in Fall 2019*

Section	No. students completing course	% of total students viewing textbook page	Page views as % of total course home page views	Average number of page views for the whole course for each student completing course
1	7	100.0	20.3	13.3
2	14	100.0	18.8	34.7
3	13	92.3	21.4	21.0
4	9	44.4	1.7	1.6
A	24	100.0	9.9	18.3
B	20	95.0	17.2	23.7
C	21	95.2	18.5	29.8
D	20	90.0	7.3	9.1
E	11	100.0	40.0	29.7
F	11	100.0	51.3	47.6
G	18	100.0	35.4	34.9
H	21	100.0	20.3	30.1
HYB	6	83.3	7.0	17.2
I	15	100.0	16.6	20.7
J	19	100.0	31.0	35.9
K	11	81.8	7.0	17.5
L	23	100.0	15.2	26.0
ZZ	24	75.0	3.3	7.0

Table 4. *Textbook Page Views Across Sections*

Statistic	Value
N	18
Mdn	22.4
M	23.2
SD	11.6
Minimum	1.6
Maximum	47.6

Note. Section means based on total of students completing ENGL 101N in fall 2019.

Discussion

In this study, the researcher found no evidence to establish a significant association between OER adoption and the academic outcomes of ENGL 101N students at NCC. These results align with Grimaldi et al.

(2019) and Hilton (2016) who observed most studies found no difference in the learning outcomes of students who used OER materials compared to those who used the commercial textbook. This study does, however, provide a likely explanation for these results by using Canvas data to measure student usage of the OER textbook. Although ENGL 101N students had access to the textbook, it appears they did not use it regularly. Canvas data showed a high percentage of ENGL 101N students accessed the OER textbook in fall 2019. However, student usage varied widely by course section and overall usage was extremely low. This finding is not surprising given the previous studies that indicate many college students do not complete their required readings (Baier et al., 2011; Berry et al., 2010; Gorzycki et al., 2019; Stratton, 2011). Further, these results suggest an important limitation of the access hypothesis: providing access to a textbook is not enough to positively influence student learning. As noted by Grimaldi et al. (2019), "the effect of access on learning depends critically on usage after access to the materials is supplied. If students engage with the book in ineffective ways, then access will be an irrelevant factor" (p. 10).

Implications for Practice

If providing access to the textbook alone does little to improve students' academic success, instructors should begin to reevaluate how they are using OER learning materials in the classroom. They must do more than simply replace the commercial textbook with an OER textbook. In his commentary on the OER movement, Mishra (2017) reinforced this point by writing, "transformation of the educational landscape and improvement in the quality of learning will be visible not because of OER per se, but due to teacher engagement with OER" (p. 378). Here open pedagogy offers a promising implication for practice. Open pedagogy or open educational practices (OEP) center on the 4R Framework of reusing, revising, remixing, and redistributing OER learning materials (Karunanayaka et al., 2015; Wiley, 2013). Open pedagogy not only encourages educators to use free materials, it also allows educators (and students) to explore more innovative ways of teaching and learning using OER (Karunanayaka et al., 2015). As an example, the faculty at Mercy College worked collaboratively to redesign reading and mathematics courses as part of the Project Kaleidoscope Open Course Initiative (Pawlyshyn et al., 2013). The goal was to increase the retention of first-year students through innovative instructional practices using OER materials. In mathematics classes, the faculty adopted an OER curriculum that utilized a flipped classroom model. After the launch of the initiative in the spring of 2011, the per-

centage of students passing the class increased from 48.40% to 68.90% by the fall of 2012 (Pawlyshyn et al., 2013). These promising results suggest the implementation of open pedagogy could be the mechanism by which OER adoption improves student learning outcomes; however, additional research is needed to prove this hypothesis.

Limitations

Although all ENGL 101N instructors provided students with access to the OER textbook on Canvas, it is important to note this study could have underestimated the number of textbook page views. This is because the actual OER textbook was a PDF document with clickable links posted under the "textbook" tab in each Canvas course. A student could have downloaded the English textbook PDF and then accessed the links outside of Canvas. This usage would not have registered in the textbook page view count.

Further, this study focused on English composition students at one community college. Because ENGL 101N instructors at NCC emphasize the writing process, it is possible students viewed the textbook as more of a supplemental resource rather than a source of information for gaining new knowledge. It would be interesting to repeat this study in a history or psychology course where instructors tend to rely more heavily on the textbook as a tool to teach course content. Given the limited scope of this study, it is impossible to determine if the findings on OER textbook usage are applicable in other contexts without additional research.

Conclusions

Because community college students are particularly sensitive to the rising costs of higher education (Fischer et al., 2015), OER adoption is an effective strategy for lowering the financial barriers that can prevent students from earning an associate degree. Beyond cost savings, some researchers have also suggested that OER adoption results in improved academic outcomes because all students have free and open access to the textbook (Hilton & Laman, 2012). This idea is known as the access hypothesis (Grimaldi et al., 2019). This study of academic outcomes and OER textbook usage of ENGL 101N students at Nashua Community College points to a simple but important limitation of this hypothesis: access to a textbook has no impact on learning outcomes if students are not using the textbook. For community college educators seeking to realize the full potential of OER, the key to academic success is likely related to the quality of student engagement with OER learning materials. As

a first step, instructors must begin to think of OER as more than just a free textbook and explore how open pedagogy fosters the development of more innovative, student-centered, instructional practices centered on the 4R framework (Karunanayaka et al., 2015; Wiley, 2013). In the end, replacing a commercial textbook with an OER textbook may save students money, but it will not be enough to improve student learning outcomes until instructors begin to reevaluate how they are using OER as an instructional tool.

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Appendix

Copy of OER Textbook from the College's Learning Management System (Canvas)

NCC ENGL101 COLLEGE COMPOSITION TEXTBOOK
TABLE OF CONTENTS

Note. At the time of this study, ENGL 101N instructors posted the OER textbook on Canvas as a PDF document with clickable links. Students had access to the online OER textbook only through Canvas. As of fall 2022, the OER textbook is also accessible through the college's website at https://library.nashuacc.edu/engl101. Professors Jennifer Tripp, Ann Healy, Elizabeth Fontanella, and Ann DeCiccio are the curators of the *ENGL 101 College Composition Textbook.*