

ARE E-TEXTS THE FUTURE OF DISTANCE EDUCATION? INVESTIGATING ONLINE STUDENTS' OPEN RESOURCE PREFERENCES

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ABSTRACT

At a private university, a correlational survey design was implemented to assess students' perceptions towards Open Educational Resources (OER) before experiencing an open course design initiative and to subsequently provide stakeholder feedback for guiding pedagogical decisions. The Student Textbook Survey was employed to determine if interest in electronic texts could predict with statistical significance student preference for OER. While the regression analysis indicated that interest in electronic texts had a significant effect on student preference for OER, $p < .001$, $OR = .17$, descriptive analysis identified the need for a variety of course material format alternatives.

Keywords: online learning, open learning, open educational resources

INTRODUCTION

In online learning, the way educators present content to students is critical for optimizing virtual instruction (Ehlers, 2013). However, developing factors, such as the cost of textbooks (i.e., the specific monetary value assigned to a text by a publisher) and course delivery methods, have influenced both online students' access to and experiences within their courses (Hilton, Wiley, Stein, & Johnson, 2010). These factors have consequently led education towards a new era of alternative resources for online teaching and learning (Skinner & Howes, 2013; Vitez, 2018).

Researchers have explored the literature and the expanse of Open Educational Resource (OER) initiatives in higher education and identified opportunities for OER in online learning (Harsasi, 2015; Hatzipanagos & Gregson, 2015). In fact, the digital nature of many open resources makes OER a growing option for virtual courses (Weller, 2014), yet findings have shown inconsistencies regarding online students' preferences (Daniel & Woody, 2013; Dennis, 2011). Within the scope of online learners' OER opinions, interest

in electronic texts is a factor that influences students' preferences.

STATEMENT OF THE PROBLEM

As institutions strive to meet the needs of their students, a point comes when the effectiveness of their educational content must be examined (Srichanyachon, 2014). A core concern of educators and institutions should be finding the best ways to select and deliver exemplary learning materials to students (Vojtech & Grissett, 2017); however, the institution's focus can stray and fundamental components, such as course content, can be undervalued (Simonson, Smaldino, & Zvacek, 2015). Targeting these foundational course aspects can improve the structure and quality of a program (Wiley, Williams, DeMarte, & Hilton, 2016). When analyzing course elements with the goal of adding OER, some researchers have espoused that this exploration needs to be guided by the viewpoints of students (Petrides, Jimes, Middleton-Dezner, Walling, & Weiss, 2011; Vojtech & Grissett, 2017). To this end, OER preperception studies have been found important for forming pivotal decisions about course content (Florida Virtual Campus

2012, 2016) The goal and meaning of preperception OER research is the same as and synonymous with a needs assessment for course design.

Significant variances have appeared in the reported benefits of OER and the collective preferences of students (Daniel & Woody, 2013). For example, studies that showed an increase in student achievement with OER (Grewe & Davis, 2017; Petrides et al., 2011) could be flawed if primarily high achieving students gravitated towards registering for OER courses due to their comfort with new resources, technology, and instructional techniques (Grewe & Davis, 2017). Also, students who favored OER in the research may have had a greater financial need (Senack, 2014; 2015).

In fact, students relying more on financial aid to fund their education have preferred OER to reduce academic expenses (Petrides et al., 2011). Similarly, international students have chosen OER due to its easy accessibility (Harsasi, 2015); however, while digital immigrants have appreciated content access, they cited technology issues as key concerns for using OER. In terms of additional variances, the format, material type, and content delivery preferences have differed with the demographic backgrounds of the students studied. Finally, students' views related to the credibility of OER have also conflicted in some research sample populations (Daniel & Woody, 2013). These varying student preferences may be further understood with additional investigation.

LITERATURE REVIEW

Technology and OER

Technology integrally connects to the OER movement because a majority of these materials are digital to increase their accessibility and adaptability (Jhangiani & Biswas-Diener, 2017; Libby & Yaeger, 2017). Online technology specifically allows teaching and learning to become more enhanced in ways that improve student engagement, interactivity, and connectivity (Terras, Ramsay, & Boyle, 2013). Kellogg, Booth, and Oliver (2014) further concluded that new technologies have aided the integration of OER into distance education. Thus, research has supported the link between instructional technology and OER (Littlejohn & Hood, 2017; Mason & Kimmons, 2018).

An effective technology structure has easy usability, and OER provides open platforms and

resources for meeting this need (Shank, 2013). For instance, at Tidewater Community College (TCC), Wiley et al. (2016) founded their research upon a user-friendly approach to open technology using open online shells with Candela platforms for students to have one access point for retrieving all digital OER. The following year, Libby and Yaeger (2017) continued studying instructional technology possibilities at TCC by reducing potential user barriers, such as technology competency hurdles and navigation structure, and emphasizing the importance of Web-creation tools for supporting technology-based learning and access to educational resources. This study once again confirmed the research of others indicating that open technologies can directly enhance the learning process for students if designed and delivered with their needs in mind (Bonk, 2009; Stoffregen & Pawlowski, 2018).

Student OER Preferences

As instructors adopt new techniques and advances for the classroom, successful initiatives are based on students' feedback (Blayone, van Oostveen, Barber, Di-Giuseppe, & Childs, 2017; Oblinger, 2012). In fact, the needs and preferences of students often play a central role in making instructional program decisions and keeping education current and relevant (Blayone et al., 2017). To illustrate this, in their research detailing the open teaching initiative at Virginia State University's School of Business, Feldstein, Martin, Hudson, Warren, and Wiley (2012) discovered that pinpointing students' course material use patterns significantly improved program retention. Therefore, this finding reinforced that for effective OER implementation, it is critical to listen to the voices of today's students and evaluate their present demands in higher education (Senack, 2014, 2015; Vitez, 2018). However, when analyzing the themes from students' feedback, there have been conflicting student OER preferences.

In particular, examining students' preferences towards OER in higher education has revealed contrasting preferences related to technology. While the creation and course integration of open resources frequently involves technologies, a divide in opinion is found related to the students' varied technical skills and backgrounds (Kellogg et al., 2014). For instance, Terras et al. (2013) proposed that digital immigrants were hesitant to

utilize open materials because of the electronic aspect. In addition, Harsasi (2015) found significant global barriers to OER integration based on international students' computer proficiencies. Supporting these views, Watson, Domizi, and Clouser (2017) drew direct correlations between OER integration and an increase in the need for institutional technology assistance.

Considering generational learning styles, studies also have found significant conflicting preferences regarding students' comfort with using digital resources. For example, Lai and Hong (2015) conjectured that learners belonging to the Millennial and Post-Millennial cohorts think and process information more effectively through the use of digital tools and applications, while this is frequently not the case for the older generations. Coates (2017) reinforced these views and proposed that digital immigrants' knowledge comprehension, course connections, and communication effectiveness could suffer if they were frustrated by technology. After further examining these

constructs, a related OER argument is educational text format preference (Daniel & Woody, 2013).

While conflicting student preferences have existed in terms of learning material formats (Daniel & Woody, 2013; Dennis, 2011), many of the surveyed students have chosen physical print materials over e-texts because of their readability and ease with notation, such as writing notes in the margin, circling subject-specific terminology, or highlighting important sections (Berry, Cook, Hill, & Stevenson, 2010; Daniel & Woody, 2013). In addition, Daniel and Woody, (2013) found that study times using print materials were significantly shorter (. In contrast, Lindshield and Adhikari (2013) concluded from their longitudinal research that a majority of undergraduate learners preferred electronic texts. In fact, they found that "Over multiple semesters, campus and online students both had positive perceptions of the flexbook and primarily used an electronic format of the OER" (p. 34). Overall, students who preferred e-texts cited access, portability, zooming options, search

Table 1. 2016–2018 School of Education Student Demographics

Year	Fall 2018		Fall 2017		Fall 2016	
Gender	N	%	N	%	N	%
Men	199	19.25%	256	21.28%	258	19.68%
Women	835	80.75%	947	78.72%	1053	80.32%
Race/Ethnicity						
African Am/Black	364	35.20%	387	32.17%	415	31.66%
Am Indian/Native Am	6	0.58%	4	0.33%	3	0.23%
Asian/Pacific Is.	13	1.26%	16	1.33%	17	1.30%
Hispanic	44	4.26%	46	3.82%	57	4.35%
Foreign/International	34	3.29%	44	3.66%	55	4.20%
White/Caucasian	535	51.74%	657	54.61%	724	55.23%
Unknown	38	3.68%	49	4.07%	40	3.05%
Full time/Part time						
Full time	96	9.28%	81	6.73%	90	7.32%
Part time	938	90.72%	1,122	93.27%	1221	93.14%
Campus/Distance						
On Campus	15	1.45%	43	3.57%	96	7.32%
Online and On Campus	3	0.29%	3	0.25%	11	0.84%
Online Only	1,016	98.26%	1157	96.17%	1204	91.84%
Citizenship						
Citizen	1,000	96.71%	1159	96.34%	1256	95.80%
Permanent Resident	11	1.06%	13	1.08%	15	1.14%
Noncitizen	23	2.22%	31	2.58%	40	3.05%

features, and financial benefits as reasons (Allen & Seaman, 2016; Ozdemir & Hendricks, 2017). Supporting this viewpoint, Yaeger and Wolfe (2018) also discovered that students in online master's courses desired interactive digital materials. Thus, research (Allen & Seaman, 2016; Illowsky, Hilton, Whiting & Ackerman, 2016; Woody, Daniel, & Baker, 2010) has presented contrasting student opinions related to text formats and has shown the need for additional examination over longitudinal periods (Woody et al., 2010), in various settings (Berry et al., 2010), and with diverse groups of students (Jhangiani & Jhangiani, 2017) to determine what the majority prefer in terms of textbook format.

METHOD

Sampling and Population

Located in the southeastern part of the United States, one private institution's School of Education served as the setting for this study. Master's programs within the selected setting offer certificates and the Master of Education degree, while at the post-master's level, degrees encompass the Education Specialist, Doctor of Education, and Doctor of Philosophy. Utilizing a convenience sample, the population for this study consisted of all master's ($n = 591$) and post-master's ($n = 443$) online learners who were enrolled during one specified spring session.

Within this environment, Blackboard is the Learning Management System for hosting online courses, and students traditionally work in an asynchronous format using selected course content and educational technologies to interact virtually with their peers and instructors. Comprising 98.26% of the school's population in 2018, most students enrolled in the School of Education are online only, with 80.75% of them female.

Instrumentation

The Student Textbook Survey (Florida Virtual Campus 2012, 2016) was selected for this study due to its design for online students, the inclusion of preperception questions, and a comprehensive evaluation of key OER factors. Based upon an official charge from the Florida Legislature to reduce textbook costs, the Student Textbook Survey was designed and distributed to obtain the preferences for the traditional textbook versus OER of online higher education students, and it was

constructed to reach any higher education student, regardless of prior OER knowledge. The Student Textbook Survey was designed to gather data in five key areas: student textbook spending, decisions as a result of material costs, text format preference, textbook use, and content delivery choices. The purposes of this specific analysis centered on textbook format preferences and content delivery choices to pinpoint student preference trends or controversies.

Given the study's scope and procedures, the Student Textbook Survey aligned with the key target variables and the population, as it centered on online students without prior knowledge of OER, while many instruments focus instead on evaluating preferences after an OER initiative has already occurred (Florida Virtual Campus, 2012, 2016). One limitation of the questionnaire is that it has not gone through a formal validation process, as the instrument was developed primarily for categorical research exploring demographic factors and preferences with multiple-choice questions (Florida Virtual Campus, 2012, 2016; Rovai et al., 2012).

Following best practices set by Bliss (2013), a small pilot study was conducted with eight individuals associated with the private university to pinpoint any confusion with the question wording or problems with the survey setting. After the survey pilot, through informal individual conversations, participants were asked if they encountered any technical issues or if any questions covered items that could have been misinterpreted. The participants communicated no issues with the technology and that they fully understood all survey questions. With the nonparametric, relational nature of this research and the consistent performance in previous OER studies for gathering students' textbook preferences (Florida Virtual Campus, 2012, 2016), the instrument was deemed appropriate for this study. To promote the overall validity of the study, standard written instructions and data collection steps were applied, and the descriptive and inferential quantitative data analysis were carried out in a methodical and precise manner following practices set by Rovai et al. (2012). Data evaluation procedures were communicated and reported systematically, and a detailed narrative of the data analysis was included.

Research Design

For gathering data at a specific point in time and evaluating the participants' current preferences, habits, and circumstances (Creswell & Creswell, 2018; Leedy & Ormrod, 2015), a correlational survey design was chosen to explore if interest in electronic texts predicts OER student preference (Creswell & Creswell, 2018; Rovai, Baker, & Ponton 2012). The data were collected from multiple-choice and multiple-answer questions.

Research Procedures

Data were collected over a two-week window (Cowles & Nelson, 2015), was entirely anonymous, and was handled electronically through a Google survey. The participant consent form and survey link were sent out by email through the School of Education administration, and the raw data were kept in a password protected drive. As a small incentive, a chance to win a \$25 Amazon gift card was offered to help increase the survey response rate (Bliss, 2013; Fink, 1993; Fowler, 1995). The link associated solely with the gift card drawing was a short URL and appeared in the submission message. Student contact information for the gift card drawing was password protected and remained confidential (i.e., only the researcher knew the participants' gift card giveaway information, and this information was not in any way connected to the survey responses). Furthermore, following best practices from survey research (Moy & Murphy, 2016; Rea & Parker, 2014) additional reminders were sent to solicit participation.

HYPOTHESIS

The specific student factor investigated in this study was interest in electronic texts. The following was the research question that guided the statistical analysis:

RQ: Is interest in electronic texts statistically significant in predicting student preference for open or traditional materials?

H₀: Interest in electronic texts is not statistically significant in predicting student preference for open or traditional materials.

RESULTS

While this research looked for a statistical significance interest in electronic texts predicting student preference for open resources, additional sections of the survey provided context regarding students' resource preferences. Following a two-week collection period, 436 students responded yielding a 41% return rate

To avoid using jargon, the term OER was not directly used in the survey questions (Harsasi, 2015); however, for this study's analysis, OER is synonymous with "alternative types of openly available resources." When asked if they would prefer alternative types of openly available resources to traditional textbooks, a majority of the participants (n = 313, 71.8%) reported that they preferred openly available resources instead of a traditional textbook.

In looking at those who preferred print, the most popular options for accessing textbooks this session were print new (n = 176, 40.37%) and used (n = 258, 59.17%; See Figure 1).

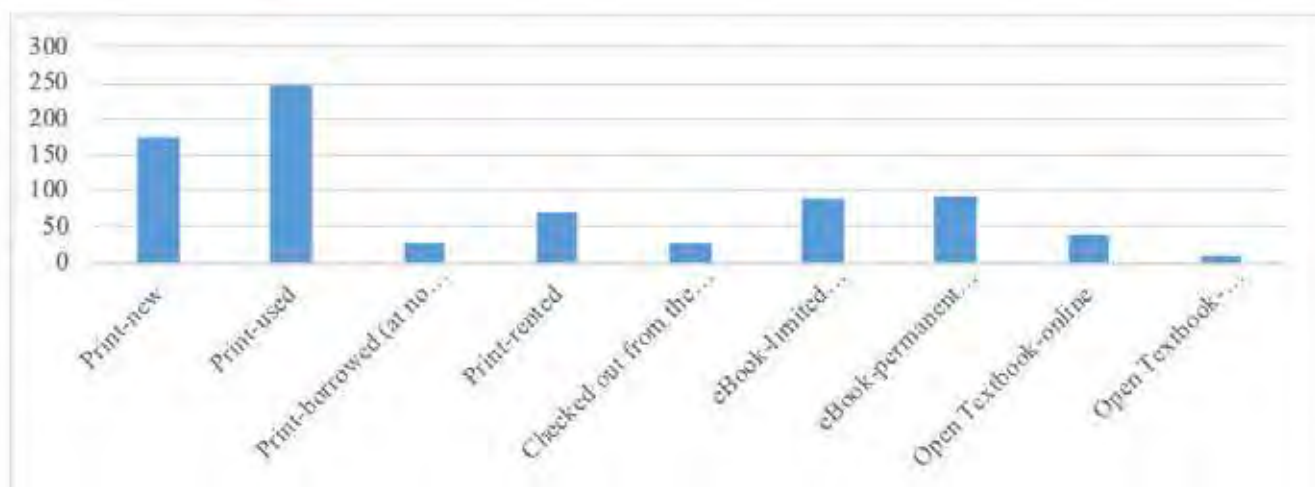


Figure 1. Access to Textbooks This Session (Survey Q17)

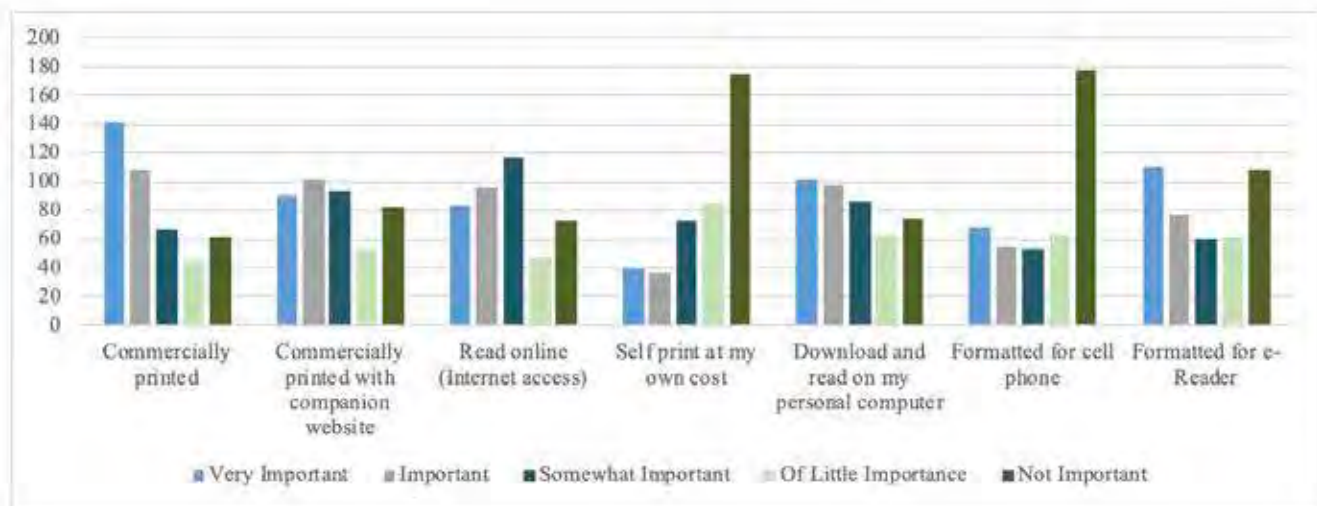


Figure 2. Importance of Textbook Format Features (Survey Q19)

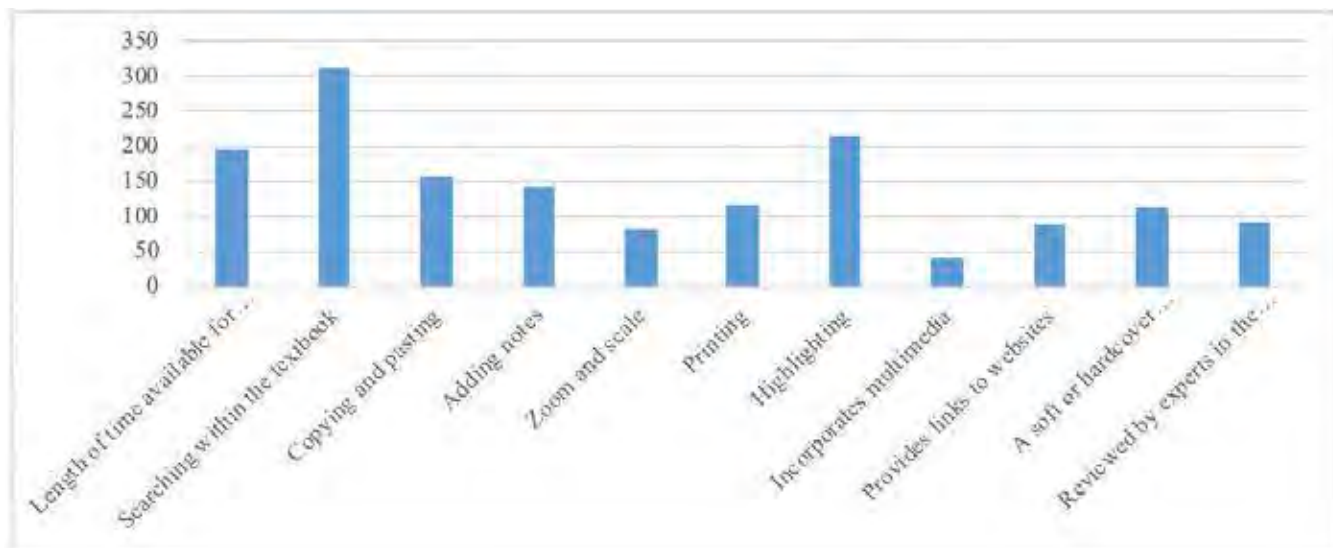


Figure 3. Most Important Features of a Digital Textbook (Survey Q20)

Moreover, when further exploring textbook format, students were presented with various textbook features (e.g., commercially printed, formatted for e-reader) and given a five-point Likert scale ranging from not important to very important for each category. Analyzing features in the very important category revealed that the two highest areas of preference were commercially printed ($n = 142$, 32.57%) and formatted for e-reader ($n = 110$, 25.23%; See Figure 2).

Regarding digital textbook preferences (Survey Q20), students were asked to choose their most valued features, which in order of highest preference were the following: searching within the textbook ($n = 311$, 71.33%), highlighting ($n = 215$, 49.31%), the length of time available for use ($n = 196$, 44.95%), and copying and pasting ($n = 157$, 36.01%; See Figure 3).

Additionally, when asked about which study aids helped them achieve good grades, most participants preferred videos ($n = 291$, 66.74%), PowerPoint slides ($n = 288$, 66.05%), and practice questions ($n = 288$, 66.05%; See Figure 4).

The results of the prediction model indicated that there is a statistical significance for interest in electronic texts (Survey Q24) predicting student preference for open or traditional materials (Survey Q16), $p < .001$ (See Table 2). Therefore, there was evidence to reject H_0 .

To further provide context, demographic and preference information from the survey were broken down by interest in electronic texts (yes, no)

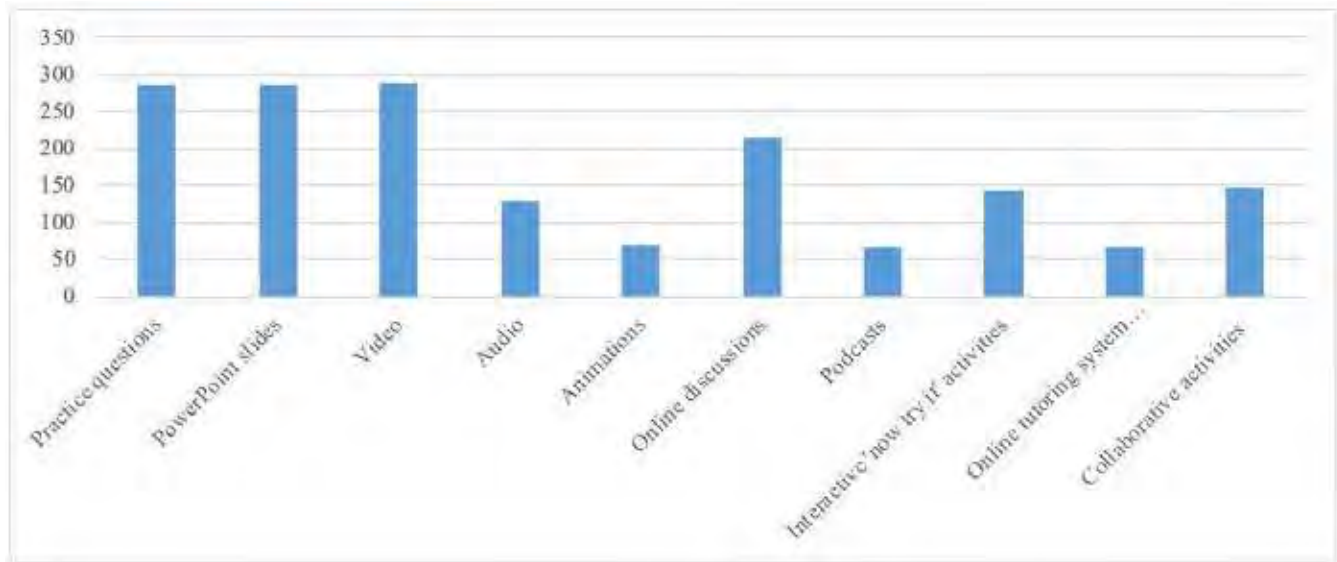


Figure 4. Preferred Study Aids (Survey Q23)

Table 2 Summary of Binomial Logistic Regression Analysis Predicting Student Preference for OER

Measure	B	SE	OR	95% CI	Wald statistic	p
Interest in E-Texts	-1.78	.23	.17	[0.78, 0.54]	57.39	<.001

Note. CI = confidence interval for odds ratio (OR); $p < .05$

to explore differences in terms of the number (n), percentage (%), and response percentage (R%) in favor of OER (Survey Q16).

Comparing response percentages in the yes preference for e-texts in terms of gender, Survey Q1 identified a slightly higher response percentage for males (n = 52, 12%, R% = 87) than females (n = 220, 50%, R% = 85); however, the range of difference was less than 5%, and this close range continued when looking at native (n = 261, 60%, R% = 85) and nonnative (n = 11, 3%, R% = 82) English language speakers (Survey Q3). An examination of student level (Survey Q4) showed a 10% difference in response percentage favoring OER and e-texts for master's (n = 143, 33%, R% = 90) and post-master's (n = 129, 30%, R% = 80) students.

As textbook spending (Survey Q11) and e-text preference were cross analyzed, the response percentage in favor of OER progressively increased from 81% to 100% in the first five spending categories (\$000–\$100: 81%, \$101–200: 84%, \$201–\$300: 87%, \$301–\$400: 91%, and \$401–\$500: 100%). In addition, when looking at formats (Survey Q15), a higher number of students preferred electronic (n = 240, 55%, R% = 88) to print (n = 32, 7%, R% = 69). Concerning textbook renting (Survey Q18), there was a slightly elevated response percentage in favor

of OER in the yes (n = 197, 45%, R% = 87) category compared to the no (n = 75, 17%, R% = 80). Yet, the difference was not over 10%, and evaluating these factors with textbook use (Survey Q21) and personal e-book use (Survey Q22) indicated no clear patterns. No single supporting variable provided reasoning for the statistical significance associated with interest in electronic texts (See Table 2).

While the binomial logistic regression model indicated a significant statistical relationship between interest in e-texts and student preference for OER, and 272 (62.4%) respondents communicated they were interested in electronic textbooks, 164 (37.6%) students were not interested in this format. When asked further about the reasons why they were not interested in electronic texts (Survey Q25), the three highest rationales were (a) liking a printed copy to write in (n = 157, 36.01%), (b) finding e-texts inconvenient to read (n = 82, 18.81%), and (c) having difficulty moving between the different pages (n = 76, 17.43%; See Figure 5).

DISCUSSION

The outcome of the binomial logistic regression prediction model indicated statistical significance for interest in electronic texts (Survey Q24) predicting student preference for open or traditional materials (Survey Q16), $p < .001$; therefore, H_0 was rejected.

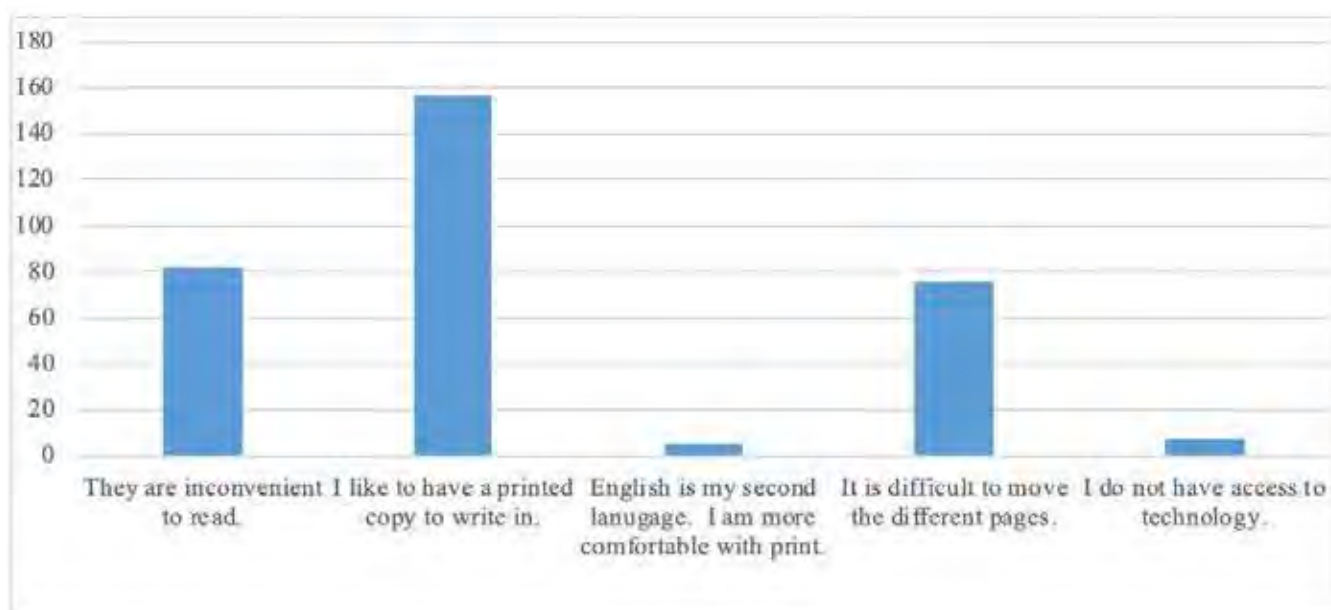


Figure 5. Reasons for Disinterest in Digital Textbooks (n = 164, 37.6%; Survey Q25)

However, while statistical significance was high for this variable, practical significance was lower, $OR = .17$. Therefore, the odds ratio of $.17$ for interest in electronic texts (Survey Q24) indicates that with a unit increase (switching from traditional materials to OER), the odds of preference for OER (Survey Q16) are multiplied by $.17$, which is an 83% (1-.17) decrease (83% less likely; Rovai et al., 2012, p. 396).

While interest in electronic texts was able to statistically predict student preference for OER with significance, students (n = 164, 37.6%) were not interested in this format (Survey Q24). Although these learners desired having open alternatives to textbooks, they also wanted to keep the valued study features of the print format. In addition, when asked how they accessed their textbooks this session (Survey Q17), students responded with print new (n = 176, 40.37%) and used (n = 258, 59.17%) as their most popular options. While students (n = 272, 62.39%) communicated an interest in electronic texts, learners wanted print materials for study purposes, supporting the findings of Berry et al. (2010) and Daniel and Woody (2013), which suggested that a core population of students still prefer physical print texts. Therefore, in this world of electronic resources, these students still favored multiple print format options.

IMPLICATIONS

For OER to thrive at a particular institution, it

must be integrated strategically based on stakeholder feedback. The outcome of the binomial logistic regression prediction model indicated statistical significance for interest in electronic texts predicting student preference for open or traditional materials, yet further considering text format preferences showed that while the participating students communicated a preference for OER, there were several conflicting opinions regarding format that support the controversy in similar OER research (Berry et al., 2010; Daniel & Woody, 2013). The foundational nature of OER is not its format but its open licensing (Bonk, 2009). Thus, while this study showed that students desire affordable alternatives to textbooks, it also emphasized that they prefer a variety of course materials, including print text, digital text, videos, and PowerPoints. Students also valued certain key aspects when using resources, such as highlighting, readability, and writing on the pages. Even in this digital world, these features typically associated with print text are favored by students. Therefore, to effectively integrate OER in this setting, a flexible approach would need to be taken by offering multiple options for course materials formats to reduce textbook expenses and meet several learning styles and preferences. OER implementation in this environment would need to blend together the best of digital and print resource options to create the market these stakeholders have requested.

LIMITATIONS AND FUTURE RESEARCH

While this study focused on gathering the traditional textbook versus OER perceptions of online master's and post-master's students, these results must be interpreted cautiously. These findings cannot be generalized to other distance education populations, and future online OER research in other circumstances could provide

further information and clarification. Given that this area of research is still novel, there are several options for continuing this exploration.

Concerning environmental validity threats, this study was limited to one School of Education at a private institution in the southeastern part of the United States. Expansion to other schools at this private university could provide additional insight

Table 3. Survey Responses Broken Down by Interest in Electronic Texts (Survey Q24)

Interest in E-texts	Yes			No		
	n	%	R%	n	%	R%
Gender (Q1)						
Male	52	12	87	31	7	39
Female	220	50	85	133	31	52
EN. Native Language (Q3)						
Yes	261	60	85	158	36	50
No	11	3	82	6	1	33
Student Level (Q4)						
Master's	143	33	90	73	17	44
Post-Master's	129	30	80	91	21	54
Textbooks Purchased (Q10)						
None	35	8	80	17	4	47
1-3	147	34	89	80	18	58
4-7	58	13	81	51	12	37
8-12	32	7	81	16	4	50
Textbook Spending (Q11)						
\$000-100	70	16	81	32	7	38
\$101-200	85	19	84	49	11	51
\$201-300	55	13	87	43	10	65
\$301-400	35	8	91	17	4	53
\$401-500	10	2	100	9	2	33
\$501-600	5	1	80	7	2	0
\$601 or more	12	3	83	7	2	57
Electronic vs. Print (Q15)						
Yes	240	55	88	41	9	56
No	32	7	69	123	28	47
Textbook Renting (Q18)						
Yes	197	45	87	82	19	52
No	75	17	80	82	19	42
Textbook Use (Q21)						
Never	111	25	82	57	13	47
Occasionally	127	29	90	98	22	52
Frequently	34	8	79	9	2	33
Personal eBook Use (Q22)						
Never	58	13	88	94	22	50
A few times a year	120	28	82	54	12	50
At least once a month	47	11	87	9	2	33
At least once a week	28	6	89	2	<1	50
Daily	19	4	89	5	1	60

Note. Where n = Number of students in the particular subgroup in the chosen category; % = Percentage of students in the particular subgroup in the chosen category; R% = Students in the subgroup who responded yes to preference for OER in survey Question 16.

for making informed decisions. Second, regarding geographical limitations, this study was limited to one private institution, and it could be beneficial to conduct similar online masters and post-master's studies at other global institutions. Additionally, this study was a preliminary needs assessment analysis, and as future stages of OER implementation are explored, further analysis could be conducted on a small scale or with entire degrees.

SUMMARY

In summary, the investigation of online master's and post-master's students' preferences towards traditional textbooks versus OER yielded information that associated OER with an interest in electronic texts. However, while there was statistical significance, $p < .001$, supporting this prediction, other information was identified that added additional context to the study, including a majority ($n = 309$, 71.8%) interest in textbook alternatives and a need for a variety of course material format alternatives. While the results of this study provided data to guide educators in this environment towards selecting textbook alternatives, additional research will be needed to gauge the impact of these decisions in certain curricula and explore these preferences on a larger scale at this private university.

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