

# 2012 Florida Student Textbook Survey



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The [Florida Distance Learning Consortium](#) was a network of all public (39) postsecondary institutions in Florida that served 1.3 million postsecondary students annually. On July 1, 2012, the Consortium was merged with three other Florida organizations to form [Florida Virtual Campus](#).

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## Executive Summary

Florida Distance Learning Consortium (FDLC) conducted a revised survey of higher education students between January 18 and April 4, 2012 as a follow-up to the 2010 Florida Student Textbook Survey. FDLC administered the earlier survey in response to the Open Access Textbooks Task Force Report (2010). The task force report was pursuant to a 2009 charge by the Florida Legislature to develop a plan for promoting and increasing the use of open access textbooks as a method for reducing textbook costs (Section 1004.091(2), Florida Statutes). The online survey of Florida higher education students was conducted to learn more about some of the issues underlying textbook costs and alternative solutions.

FDLC developed the revised statewide student survey on textbook acquisition and use with the collaboration of the Board of Governors (BOG) of the State University System of Florida and staff of the Division of Florida Colleges (DFC). In addition, the Consortium commissioned a consulting statistician, Eric Thomas, Senior Research Analyst with Statistics & Dissertation Services, LLC, to assist with developing survey questions and analyzing the survey data.

The purpose of the survey was to assess students' textbook acquisition choices, the reasoning behind them, and the attitudes of students who face the harsh reality of rising textbook costs. Specific objectives of the survey were to identify:

- how much Florida students spent on textbooks during the Spring 2012 semester
- the frequency with which students buy textbooks that are not used
- how students are affected by the cost of textbooks
- what formats students prefer
- what functions students find important
- students perceptions of the availability of textbooks in their institutions' libraries
- what study aids students perceive to be the most beneficial to their learning

During the spring of 2012, local campus officials solicited student participation. Over 20,000 ( $n = 22,129$ ) students from all 11 of Florida's state universities and 22 of its 28 colleges, community colleges and state colleges agreed to participate in the anonymous online survey. Of the respondents, 10,874 (53%) were enrolled in universities, 9,717 (47%) were enrolled in colleges, and 485 (2%) of those were enrolled in both a university and a college.

Concurrent with the student survey, FDLC conducted a survey of Florida postsecondary faculty and administrators to examine the climate for open educational resources (OER). A report of that survey's results can be obtained through the Open Access Textbooks project website, [www.openacesstextbooks.org](http://www.openacesstextbooks.org). On questions selected for their comparative value, responses of faculty and staff were examined for similarities and differences to the students' responses. The next section provides a summary of key findings from the faculty and staff survey.

## **Summary of Key Findings**

- ❖ **Key Finding 1: Students are generally unaware of open textbooks and their potential for use as supplementary text or for saving them money.** Almost three-quarters (73%) had never heard of open textbooks. Explanations for this may include low usage in their program, the term may not be applied even when using an open textbook, or they may be unfamiliar with the term because only portions of an open textbook are used in their courses.
- ❖ **Key Finding 2: Students are generally unaware of open courseware and its potential to help them prepare for a course or learn difficult material.** More than two-thirds (68%) had never heard of open courseware on the tenth anniversary of MIT OpenCourseWare. Open courseware is a vast, rapidly expanding source of open educational resources that is apparently going untapped by all but 10% of Florida students.
- ❖ **Key Finding 3: Textbook costs continue to take a toll on students financially and academically.** Fifty-four percent spent more than \$300 on textbooks during the Spring 2012 term and 19% spent over \$500. More than half do not have financial aid that covers any of their textbook costs. More than half (63%) reported not having purchased the required textbook because of the high cost, and almost one-fourth reported doing without frequently (23%). Academically, 31% reported not registering, 35% took fewer courses, 14% dropped a course, and 10% withdrew from a course.
- ❖ **Key Finding 4: Students use various means to reduce costs of textbooks, including purchasing books from a source other than the campus bookstore, renting textbooks, purchasing used books, selling their used books, and using copies on reserve at the campus library.** A large portion of the students reported buying books from sources other than their campus bookstore (78%), 74% reported they would rent textbooks if it saved them money, and one-fifth (20%) reported using a reserve copy from their campus library.
- ❖ **Key Finding 5: Most students are willing to pay a small textbook materials fee for each course in which they use an open textbook.** Sustaining an open textbook authoring and editorial process requires a source of funds. Sixty-one percent reported being willing to pay between \$5 and \$10 open textbook material fee and 31% said maybe.
- ❖ **Key Finding 6: The purchases of digital textbooks are increasing.** In 2012, students reported buying limited licensed (16% up from 9% in 2010) and permanent access (8.4% up from 3.5 % in 2010) digital textbooks. Several factors point to increasing digital textbooks sales and their eventual dominance of the textbook market, including improvements of interactive features of software, portability of devices, and lower costs.
- ❖ **Key Finding 7: Some institution's libraries provide textbooks for checkout, extending a lifeline to students who cannot afford to purchase a textbook.** Almost half (44%) indicated that their libraries provided textbooks for checkout in print, digital, or both formats. However, nearly half (47%) did not know and 9% said textbooks were not available for checkout.
- ❖ **Key Finding 8: Students as well as faculty perceive interactive digital study aids as supportive of student learning.** For most subject areas, it is essential for learners to test and improve their knowledge and skills through practice and feedback. The students perceived interactive practice questions, flash cards, and PowerPoint slideshows as more useful than the faculty. The faculty perceived video, animations, interactive try-it-now activities, and online study groups as more useful than the students perceived them.
- ❖ **Key Finding 9: Although over half perceived open textbooks, open courseware, and OER to be similar or greater in academic value to commercial resources, approximately one-third did not know their commercial value or the opportunities they present.** Open textbooks were rated as similar or more valuable by 63%, open courseware was rated similarly by 51%, and open educational resources by 55%, when compared to commercial resources. It is important to note that a third or more (33%, 39%, 36% respectively) expressed that they did not know their comparative value.
- ❖ **Key Finding 10: Students value highly having lifetime access to digital textbooks in their major area of study.** Seventy percent of the respondents indicated that having lifetime access to digital textbooks in their major area of study was important or very important. Lifetime access to other textbooks, however, is considerably less important to them.

## Introduction

The climate in which this study was conducted includes a sluggish economy and increasing costs associated with higher education, i.e. tuition, fees, and textbooks.<sup>1</sup> Together, these costs challenge the means of all but the wealthiest of students to continue their education. Textbooks involve a monetary cost to the producer as well as the student consumer. Unlike most products, however, the student consumer generally does not choose which textbook will be purchased. The challenges confronting students in finding a way to pay for or continue their education<sup>2</sup> could in turn decrease the number of college graduates in the U.S. and ultimately the quality of the country's internal and international economic competitiveness.

Within the last decade, major advances in information, communication, and instructional technology are credited for developing more efficient, effective and economical ways to support teaching and learning. To better understand the factors affecting students' use of educational materials, both print and digital, this survey collected information on students' costs, cost consequences, preferences for formats and functions, means of acquisition, and use of educational resources in Florida's higher educational system. Results of this research are intended to provide data to educators and policymakers with which to make informed decisions about future directions for higher education textbooks and other educational resources. The next section outlines the methodology used for this study.

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<sup>1</sup> According to the [College Board](#) (2011), the average postsecondary student at a four-year public college paid \$1,137 for textbooks during the 2010-2011 academic year. Since 1994, the cost of textbooks has risen at nearly four times the rate of inflation ([Student PIRGs](#), n.d.).

<sup>2</sup> For some students, textbook costs become the "tipping point" between going to college and not being able to afford to go to college ([Student PIRGs](#), n.d.).

## Methodology

Florida Distance Learning Consortium (FDLC) conducted a revised survey of higher education students between January 18 and April 4, 2012 as a follow-up to the 2010 Florida Student Textbook Survey. FDLC administered the earlier survey in response to the Open Access Textbooks Task Force Report (2010). The task force report was pursuant to a 2009 charge by the Florida Legislature to develop a plan for promoting and increasing the use of open access textbooks as a method for reducing textbook costs (Section 1004.091(2), Florida Statutes). The online survey of Florida higher education students was conducted to learn more about some of the issues underlying textbook costs and alternative solutions.

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- how much Florida students spent on textbooks during the Spring 2012 semester
- the frequency with which students buy textbooks that are not used
- how students are affected by the cost of textbooks
- what formats students prefer
- what functions students find important
- how students obtain their required textbooks
- students perceptions of the availability of textbooks in their institutions' libraries
- what study aids students perceive to be the most beneficial to their learning

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## Results

The results of this study add to the understanding of how Florida higher education students perceive the impact of textbook cost on their academic decisions and outcomes, and their use of digital textbooks and educational resources. Following are the major findings from this study.

### **Section 1: Familiarity with OER**

❖ **Key Finding 1: Students are generally unaware of open textbooks and their potential for use as supplementary text or for saving them money.**

Only about one-quarter of students (26%) indicated they had ever heard of open textbooks<sup>3</sup>, and only 6% reported using some or all of an open textbook in a course (see Table 1).

Table 1

*How familiar are you with open textbooks?*

Response	<i>n</i>	%
I have never heard of open textbooks.	10,007	72.8
I have heard of open textbooks but never looked for any.	1,823	13.3
I've looked at some open textbooks.	997	7.2
I've used a part of or an entire open textbook in my course(s).	811	5.9
Other	115	0.8

Note. *n* = 13,753.

**Faculty and staff familiarity:** In contrast, the respondents to the faculty and staff survey indicated considerably more awareness of open textbooks than the students did. Almost three-quarters (73%) of the faculty and staff had heard of open textbooks compared to 26% for the students. As did the students, however, 6% of the faculty and staff reported having used part or all of an open textbook.

❖ **Key Finding 2: Students are generally unaware of open courseware and its potential to help them prepare for a course or learn difficult material.**

Students demonstrated somewhat more familiarity with open courseware than they did with open textbooks. However, only about one-third (32%) reported having heard of open courseware, among whom 12% had heard of it but not seen it, 10% had visited one or more open courseware sites but had not used the material, and 10% had taken one or more open courses. Of the 1,344 students who had used open courseware, 30% had taken one or part of one course, 53% had taken between 2 and 5 courses, and 17% reported taking more than 5 courses (see Table 2).

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<sup>3</sup>A definition of open textbooks was provided to respondents: “Open Textbooks are digital textbooks that are freely accessible and available at no cost. They can be read online, downloaded to a computer or mobile device, saved permanently, and self-printed. Print copies of some open textbooks are available at low cost through a publisher or commercial ‘print on demand’ services.”



**Table 2*****How much experience have you had with open courseware?***

Response	<i>n</i>	%
I have never heard of it before.	9,366	68.2
I have heard of it, but not seen it.	1,611	11.7
I have visited one or more open courseware sites but have not used the material.	1,425	10.4
I have taken one or more courses.	1,331	9.7

*Note.* *n* = 13,733.

**Reasons for using open courseware:** The student respondents who had used open courseware were asked for what reasons they had used it: 72% indicated that they had enrolled in a course that used open courseware; 30% said they had used it for self-education or self-improvement (see Table 3).

**Table 3*****For what reasons have you used open courseware? Check all that apply.***

Reason	Yes		No	
	<i>n</i>	%	<i>n</i>	%
Enrolled in a course that used all or part of the content from an open courseware	964	72.4	367	27.6
Preparation for taking a for-credit course	219	16.5	1,112	83.5
To gain qualifications or boost my career	129	9.7	1,202	90.3
To refresh or extend my knowledge of a subject I already know	294	22.1	1,037	77.9
Self-education or self-improvement	395	29.7	936	70.3
Curiosity	263	19.8	1,086	81.6
Other	57	4.3	1,274	95.7

*Note.* *n* = 1,331.

**Faculty and staff familiarity:** As with open textbooks, faculty and staff expressed more familiarity with open courseware than students did. Four-fifths (80%) indicated that they had heard of open courseware, and 23% of those respondents had taken some or all of an open course.

## **Section 2: Cost of Textbooks**

### **❖ Key Finding 3: Textbook costs continue to take a toll on students financially and academically.**

**Student expenditures – Spring 2012:** Textbook costs continue to be high. Fifty-four percent spent more than \$300 on textbooks during the Spring 2012 term, and 19% spent over \$500. The most frequently selected response reflecting students textbook cost was the \$201-300 range for the Spring 2012 term (21%), which was followed closely by \$301-400 range (20%). Nearly 75% of the respondents reported spending more than \$200 on textbooks during the Spring 2012 term

(see Figure 1). The 2010 survey revealed similar percentages for the Fall 2010 term, although the number of respondents was smaller (see Figure 2).

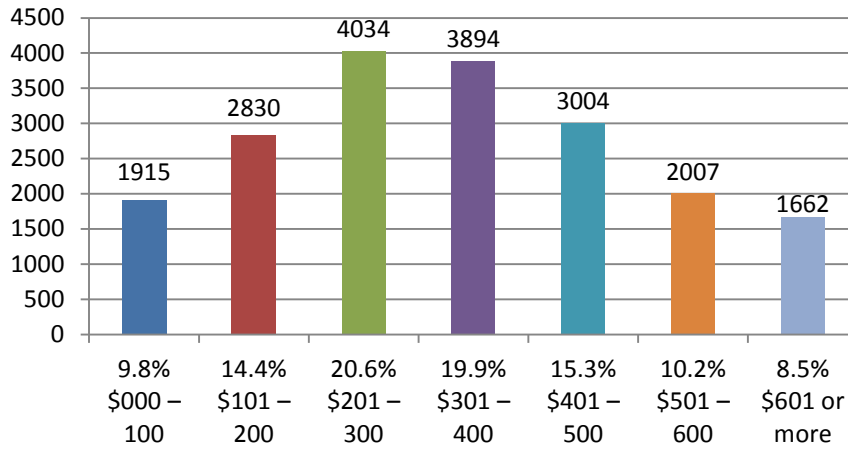


Figure 1. Numbers and percentages of students by expenditure category in Spring 2012.

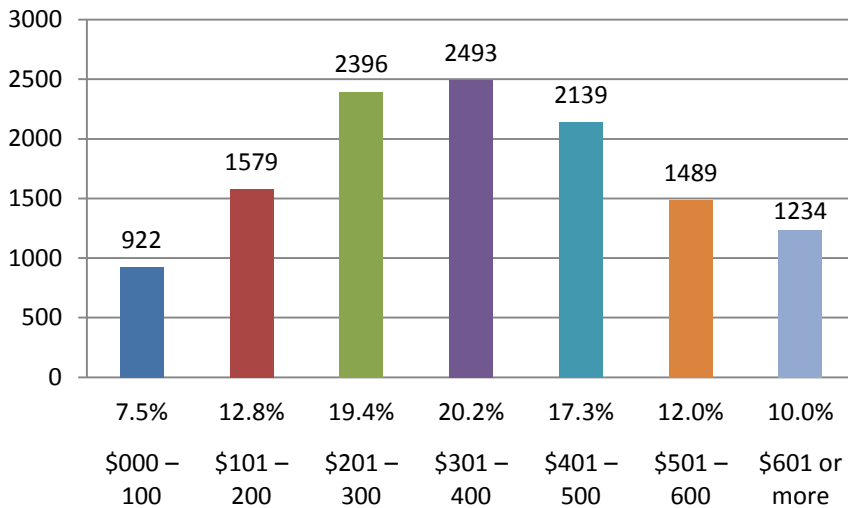


Figure 2. Numbers and percentages of students by expenditure category in Fall 2010.

**Percentage of textbook cost covered by financial aid:** Just one quarter (25%) reported that they did not receive financial aid and 29% reported that financial aid did not cover any of the textbook costs for the Spring 2012 term. Among the 44% who reported receiving financial aid for textbooks, more than one quarter (28%) had all of their textbook costs covered, and 16% had a portion of their costs covered by financial aid (see Table 4).

**Table 4*****What percentage of your textbook costs is covered by financial aid for the Spring 2012 term?***

Variable	<i>n</i>	%
I do not receive financial aid	4,903	25.0
None	5,696	29.0
Less than 25%	1,103	5.6
26% - 50%	811	4.1
51% - 75%	578	2.9
\$76 – 99%	663	3.4
All of my textbooks costs	5,461	27.9
Other	393	2.0

*Note. n = 19,608.*

**Unused required textbook:** The average participant purchased 1.6 textbooks that were not used during the participant’s academic career (see Table 5). On examination of the number of required books not used by degree sought, the data shows that those seeking a bachelor’s degree with 61+ credits were more likely to deal with unused required texts than those seeking an associate degree, a bachelor’s degree with 0-30 credits, a master’s degree, or a doctorate. The difference between the groups was significant but small (see Appendix, Section 20).

**Table 5*****Of all the textbooks you have been required to purchase, approximately how many were NOT used during your classes?***

	<i>n</i>	Min.	Max.	<i>M</i>	<i>SD</i>
Required Textbooks Not Used	18,451	0.0	15.0	1.60	2.11

**Cost consequences:** The respondents were asked if the cost of textbooks had caused them to take certain actions to reduce those costs (see Table 6). The same question was asked in the 2010 survey, but with fewer options. Students reported that the high cost of textbooks had caused them to, frequently, occasionally, or seldom:

- Not purchase the required textbook (64%, down from 65% in the 2010 survey)
- Not register for a course (45%, up from 36% in the 2010 survey)
- Take fewer courses (49%\*)
- Drop a course (27%\*)
- Withdraw from a course (21%, even with 21% in the 2010 survey)
- Fail a course (17%, up from 16% in the 2010 survey)

\* option not provided on 2010 survey

**Table 6***In your academic career, has the cost of required textbooks caused you to:*

Action	Never		Seldom		Occasionally		Frequently	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Take fewer courses	9,441	50.8	2,675	14.4	4,390	23.6	2,069	11.1
Not register for a specific course	10,191	54.9	2,646	14.2	3,893	21.0	1,843	9.9
Drop a course	13,598	73.3	2,336	12.6	1,762	9.5	861	4.6
Withdraw from a course	14,714	79.3	2,013	10.8	1,194	6.4	632	3.4
Earn a poor grade because I could not afford to buy the textbook	12,262	66.1	2,932	15.8	2,404	13.0	959	5.2
Fail a course because I could not afford to buy the textbook	15,363	83.0	1,708	9.2	912	4.9	530	2.9
Not purchase the required textbook	6,726	36.4	2,730	14.8	4,843	26.2	4,170	22.6
Other	3,954	73.2	202	3.7	377	7.0	868	16.1

*Note: n = 18,587.*

- ❖ **Key Finding 4: Students use various means to reduce costs of textbooks, including purchasing books from a source other than the campus bookstore, renting textbooks, purchasing used books, selling their used books, and using copies on reserve at the campus library.**

**Measures taken to reduce costs:** Unsurprisingly, almost all students (97.3%) reported using one or more approaches to reduce the costs of their textbooks (see Table 7). However, more than three-quarters (78%) reported having purchased books from a source other than the campus bookstore to cut costs. Almost two-thirds (66%) reported having sold their used books and nearly as many (63%) said they had bought used books, but students were not asked whether

**Table 7***What measures have you taken to reduce your required textbook costs? Check all that apply.*

Action	Yes		No	
	<i>n</i>	%	<i>n</i>	%
Do not attempt to reduce textbook costs	510	2.7	18,077	97.3
Buy used copies from the campus bookstore	11,776	63.4	6,811	36.6
Buy books from a source other than the campus bookstore	14,557	78.3	4,030	21.7
Buy a digital version of a textbook	5,296	28.5	13,291	71.5
Buy only the digital textbook chapters needed for the course	1,386	7.5	17,201	92.5
Rent printed textbooks	7,722	41.5	10,865	58.5
Rent digital textbooks	1,818	9.8	16,769	90.2
Use a reserve copy from the campus library	3,807	20.5	14,780	79.5
Share books with classmates	8,058	43.3	10,529	56.6
Sell used books	12,282	66.1	6,305	33.9

*Note. n = 18,587.*

they sold their used books to the campus bookstore, directly to another student, or to an online merchants (e.g., Amazon). One-fifth (20%) reported that they had used a reserve copy from the campus library. Only 42% reported having rented printed textbooks and 10% that they had rented digital textbooks.

**Willingness to rent textbooks:** Renting textbooks to reduce costs is clearly an option for most students. Nearly three-quarters of respondents (74%) said they would rent textbooks if it would save them money, but a sizable segment of that group (35%) reported a preference for only renting the print edition. Merely 2.4% said they would rent only the digital edition. Some students, however, expressed resistance: 10% answered “no,” that they would not rent, but 16% said “maybe” (see Table 8). More research is needed to understand students’ perceptions of renting digital and print textbook formats, particularly because access rights to digital textbooks typically follow a prescription model and are time limited. The concerns of the hesitant students might be an important factor guiding institutions’ licensing agreements with publishers for digital textbooks.

**Table 8**

*Would you rent one or more of your required textbooks if it saved you money?*

Response	<i>n</i>	%
Yes, either printed or digital	5,598	35.9
Yes, only if printed	5,495	35.3
Yes, only if digital	368	2.4
No	1,582	10.2
Maybe	2,536	16.3

*Note.* *n* = 15,579.

❖ **Key Finding 5: Most students are willing to pay a small textbook materials fee for each course in which they use an open textbook.**

Students strongly favored the idea of paying a fee to support open textbook production and maintenance; 61% of students responding said they were willing to pay between \$5 and \$10 to support keeping open textbooks current and to support future development of open textbooks. Those who did not answer “yes” were most likely to answer “maybe,” indicating an openness to the idea of open textbooks (see Table 9).

However, some students were reluctant: 31% answered “Maybe,” and only 6% answered that they would not be willing to pay such a fee. The open-ended responses from the “Other” category provided indications that misunderstanding, ambivalence, or conditional acceptance was based on concerns that:

- the fee might be charged in addition to the fee for the usual textbook
- the fee might be charged every time students access or use the open textbook online
- financial aid might not cover the fee

These concerns may have deterred some respondents from answering “Yes.” Open-ended responses from the question about textbook familiarity also provided misgivings about open textbooks:

- they might not have the opportunity to purchase a print edition
- the “print on demand” option might not always be available
- the open textbook might add to their textbook cost instead of reducing it
- they might not be able to highlight or annotate the text (The option to highlight or annotate an electronic version of the text is not available in all digital versions of open textbooks.)
- the quality of the open textbook might be unsatisfactory.

**Table 9**

*Instead of paying for a standard commercial textbook, would you be willing to pay a course registration fee between \$5 and \$10 for lifetime access to each open textbook you use to keep that textbook up-to-date and help fund production of additional open textbooks?*

Response	<i>n</i>	%
Yes	8,451	61.4
No	833	6.1
Maybe	4,274	31.1
Other	195	1.4

*Note. n = 13,753.*

Groups of students seeking different degrees were significantly different in their willingness to pay the fee, although the differences were small. A comparison of the group data indicated that students at higher education levels (64.3% - 64.7%) were more likely to say “yes” to paying a registration fee for permanent access to their open textbooks than those seeking an associate’s degree (59.6%). See the Appendix, Section 19 for the chi-square analysis.

### **Section 3: Format and Feature Preferences**

❖ **Key Finding 6: The purchases of digital textbooks are increasing.**

Table 10 presents the numbers and percentages of students who reported various combinations of means and formats in which students acquired textbooks for the spring 2012 term and for the fall 2010 term. The largest increases were in digital textbooks, with both limited ownership license and permanent access. A large proportion of students reported purchasing used printed textbooks (74%) and more than half reported purchasing new printed textbooks (58%). The data show minor increases in borrowed books, rented print copies, books checked out from the library or inter-library loans, A slight decrease can be seen in publisher bound and printed open textbooks.

**Table 10**

**Textbook Access for Spring 2012 and Fall 2010 – For [this term], how do you access your required textbooks? Check all that apply.**

Textbook Format	Spring 2012		Fall 2010	
	<i>n</i>	%	<i>n</i>	%
Print –New	7,961	57.9	6,915	55.9
Print –Used	10,201	74.2	9,317	75.3
Print –Borrowed (no cost)	2,232	16.2	1,754	14.2
Print –Rented	3,778	27.5	3,014	24.4
Checked out from the library or inter-library loan	923	6.7	644	5.2
Digital textbook – limited ownership license	2,204	16.0	1,119	9.0
Digital textbook – permanent access	1,156	8.4	438	3.5
Open textbook – online, download to personal computer, self-print	666	4.8	552	4.5
Open textbook – publisher bound and printed	226	1.6	268	2.2

Note. 2012 *n* = 13,753; 2010 *n* = 12,370.

**Importance of textbook formats:** Students were asked, assuming cost is not a factor, how important they considered various textbook formats. Eighty percent of students considered publisher bound and printed textbooks a very important or important format. Substantially less (39%) perceived the digital textbook that can be downloaded and read on a personal computer to be an important or very important format (see Table 11).

**Table 11**

**Assume cost is not a factor. How important are the following textbook formats to you?**

Textbook Format	Very Important		Important		Somewhat Important		Of Little Importance		Not Important	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Publisher bound and printed	9,098	58.5	3,375	21.7	1,414	9.1	732	4.7	943	6.1
Publisher bound and printed with companion website	5,853	37.6	3,842	24.7	2,786	17.9	1,577	10.1	1,509	9.7
Download and read on personal computer	2,954	19.0	3,039	19.5	4,166	26.8	2,975	19.1	2,419	15.6
Formatted for cell phone	1,677	10.8	1,476	9.5	2,324	14.9	3,306	21.3	6,767	43.5
Formatted for ebook reader (e.g. Kindle, iPad, other)	2,844	18.3	2,286	14.7	2,908	18.7	2,642	17.0	4,751	30.5
Formatted for print disabilities assistive technology	1,444	9.3	1,151	7.4	2,008	12.9	2,642	17.0	8,287	53.4
Read online (Internet access)	2,751	17.7	2,973	19.1	3,962	25.5	2,608	16.8	3,265	21.0
Audio version	1,651	10.6	1,519	9.8	2,393	15.4	3,060	19.7	6,936	44.6

Note. *n* = 15,567.

**Preferences for digital textbook features:** The five most important features students identified in digital textbooks were:

1. searching within the book,
2. adding notes,
3. text size control,
4. copying and pasting, and
5. highlighting (see Table 12).

These are all standard features in digital textbooks in aggregators such as CourseSmart and Courseload, and are also features available in PDF readers such as Adobe Reader.

**Table 12**

*Please rank the five most important features of a digital textbook with 1 as the most and 5 as the least.*

Feature	<i>n</i>	median	mode
Text size control	9,412	3.0	1.0
Searching within the textbook	12,908	1.0	1.0
Copying and pasting	9,036	3.0	3.0
Adding notes	9,686	3.0	3.0
Self-printing at my own cost	6,545	4.0	5.0
Highlighting	8,286	3.0	3.0
Provides links to websites	4,077	4.0	4.0
Incorporates video	3,857	4.0	5.0
Incorporates interactive figures, diagrams, or images	6,245	3.0	4.0
Social bookmarking and commenting	2,996	5.0	5.0

*Note.* 1 = Most Important, 5 = Least Important. *n* = 14,734.

**Reasons for possible disinterest in digital textbooks:** The top four reasons why students indicated they may not be interested in using digital textbooks were:

1. desire to have a printed copy to write in and highlight text (74%),
2. inconvenience of reading electronic text (61%),
3. difficulty of moving within text (48%), and
4. lack of access to technology for using digital textbooks (17%) (see Table 13).

Although only 680 respondents indicated that they have a print disability in the demographics section of the survey (see Appendix, Section 1.), 935 indicated that some digital textbooks were not compatible with their print disability solutions and 1,021 indicated that some digital e-reader devices were not compatible with their print disability solutions. A possible reason for confusion regarding print disabilities on this question is that, unlike the demographics question which included examples of print disabilities (“e.g., reading disability, dyslexia, dysgraphia, visual impairment”), this question did not provide examples. Efforts will be made to include examples in future revisions of the survey.



**Table 13****Which of the following reasons explain why you may not be interested in using digital textbooks? Select all that apply.**

Reason	Yes		No	
	<i>n</i>	%	<i>n</i>	%
They are inconvenient to read.	9,057	61.2	5,731	38.8
I like to have a printed copy to write in and highlight text.	10,933	73.9	3,855	26.1
English is my second language. I am more comfortable with a print copy of a textbook.	737	5.0	14,051	95.0
It is difficult to move to different pages/sections of the book.	7,068	47.8	7,720	52.2
Some digital textbooks are not compatible with my print disability solutions.	935	6.3	13,853	93.7
Some digital e-reader devices are not compatible with my print disability solutions.	1,021	6.9	13,767	93.1
I do not have access to the technology to take advantage of digital textbooks.	2,453	16.6	12,335	83.4

*Note.* *n* = 14,788.

### **Section 4: Additional Factors**

#### **❖ Key Finding 7: Some institution’s libraries provide textbooks for checkout, extending a lifeline to students who cannot afford to purchase a textbook.**

Nearly half (47%) of the respondents reported that they did not know whether their institutions’ libraries provided textbooks for checkout. Those that answered positively (44%) reported that their institutions’ libraries provided textbooks for checkout in print format (29%), in digital format (0.3%), or in both print and digital formats (14%). Relatively few (9%) answered that their libraries did not offer textbooks for checkout (see Table 14).

**Faculty and staff responses:** On the faculty and staff survey, nearly one-quarter (23%) of the respondents indicated that they did not know whether their institutions’ libraries provide a copy of their textbook for check out. Almost half (48%) of the respondents indicated that their institutional libraries provide a copy of their textbook for check out, 43% in print format only, less than 1% in digital format only, and 5% in both print and digital formats.

**Table 14*****Does your institution’s library provide textbooks for checkout?***

Response	<i>n</i>	%
Yes, in print format	4,263	29.0
Yes, in digital format	42	0.3
Yes, in both print and digital formats	2,103	14.3
I don’t know	6,979	47.4
No	1,329	9.0

*Note.* *n* = 14,716

❖ **Key Finding 8: Students as well as faculty perceive interactive digital study aids as supportive of student learning.** Students were asked to rank the top five digital study aids of 9 provided. The study aids most frequently ranked highest by students as most supportive of their learning were:

1. interactive practice questions (91%),
2. PowerPoint slide shows (76%),
3. flash cards (70%),
4. video (68%), and
5. interactive ‘try-it-now’ activities (60%) (See Table 15.)

**Faculty and staff responses:** The study aids most frequently ranked highest on the faculty and staff survey as supportive of student learning were “interactive practice questions” (88%), “video” (76%), “interactive ‘try it now’ activities” (74%), and “PowerPoint slide shows” (70%). “Interactive practice questions” and “interactive ‘try it now’ activities” were most commonly ranked number one.

Table 15

*From the nine types of study aids listed below, what digital study aids do you find to be most useful to support your learning?*

Digital aid	Rank				
	1 Most Important	2	3	4	5 Least Important
Interactive practice questions	<b>48.9% (6,230)</b>	21.9% (2,792)	14.4% (1,835)	8.8% (1,124)	5.9% (752)
Flash cards	17.8% (1,738)	<b>31.1% (3,037)</b>	19.4% (1,897)	15.7% (1,536)	16.1% (1,572)
PowerPoint slide shows	21.5% (2,302)	23.5% (2,519)	<b>26.8% (2,872)</b>	16.2% (1,735)	11.9% (1,276)
Video	12.3% (1,181)	18.5% (1,775)	23.7% (2,276)	<b>28.9% (2,774)</b>	16.5% (1,585)
Audio	4.7% (240)	11.7% (595)	18.2% (922)	26.0% (1,319)	<b>39.3% (1,995)</b>
Animations	5.8% (325)	12.2% (680)	21.9% (1,219)	28.9% (1,604)	<b>31.1% (1,728)</b>
Interactive ‘try it now’ activities	15.6% (1,315)	21.2% (1,792)	21.9% (1,851)	<b>23.7% (1,999)</b>	17.6% (1,488)
Online study groups	3.3% (119)	7.8% (283)	12.2% (443)	25.1% (908)	<b>51.5% (1,865)</b>
Online tutoring system provided by the college	10.3% (432)	12.9% (541)	16.5% (691)	23.7% (994)	<b>36.6% (1,532)</b>

Note. Boldface indicates highest frequency for the study aid.  $n = 14,045$ .

**Table 16***From the nine types of study aids listed below, what digital study aids do you find to be most useful to support your learning?*

Feature	<i>n</i>	median	mode
Interactive practice questions	12,733	2.0	1.0
Flash cards	9,780	3.0	2.0
PowerPoint slide shows	10,704	3.0	3.0
Video	9,591	3.0	4.0
Audio	5,071	4.0	5.0
Animations	5,556	4.0	5.0
Interactive 'try it now' activities	8,445	3.0	4.0
Online study groups	3,618	5.0	5.0
Online tutoring system provided by the college	4,190	4.0	5.0

Note. 1 = Most Importance, 5 = Least Important; *n* = 14,045.

❖ **Key Finding 9: Although over half perceived open textbooks, open courseware, and OER to be similar or greater in academic value to commercial resources, approximately one-third did not know their commercial value or the opportunities they present.**

Students were asked how they rate the academic value of open textbooks, other OER, and open courseware, compared to commercial products. Approximately one-third of the students said they did not know. Among those that offered an evaluation, students were very positive. They judged open resources similar in value to, or more valuable than, the commercial counterpart for each of the three types of resources. Examining only the respondents who offered judgment of the resources, 93% judged open textbooks similar or more valuable, 86% judged other OER similar or more valuable, and 84% judged open courseware similar or more valuable than their commercial alternatives (see Table 17).

**Table 17***How does the academic value of the following types of open resources compare to resources provided by commercial publishers?*

	More Valuable		Similar in Value		Less Valuable		Don't Know	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Open Educational Resource								
Open textbooks	6,034	44.2	2,512	18.4	634	4.6	4,462	32.7
Other open educational resources	2,719	19.9	4,806	35.2	1,249	9.2	4,868	35.7
Open courseware	3,467	25.4	3,480	25.5	1,360	10.0	5,335	39.1

Note: *n* = 13,642.

**Faculty and staff responses:** The faculty perceived video, animations, interactive try-it-now activities, and online study groups as more useful than the students perceived them. The students perceived interactive practice questions, flash cards, and PowerPoint slideshows as more useful than the faculty.

❖ **Key Finding 10: Students value highly having lifetime access to digital textbooks in their major area of study.**

Students were asked to rate the importance of having lifetime access to a digital version of the required textbook in each of 11 subject areas and in their major area of study. Although the individual subject areas were not judged highly, 70% of the respondents indicated that having lifetime access to the digital textbook in their major area of study was important or very important. The variations in subject areas were slight, with the means ranging between “somewhat important” and “of little importance.” The most common judgment for each specified subject area was “not important” (see Table 18).

**Table 18**

*How important to you is having lifetime access to a digital version of a required textbook in the following subject areas?*

Subject Area	<i>n</i>	<i>M</i>	<i>SD</i>
My major area of study	15,579	2.08	1.42
Business and Consumer Science	15,579	3.64	1.41
Communication and Information	15,579	3.61	1.40
Education	15,579	3.57	1.46
Engineering and Technology	15,579	3.66	1.48
Health Science	15,579	3.31	1.58
Humanities	15,579	3.73	1.38
Mathematics	15,579	3.43	1.53
Professional, Career, and Technical	15,579	3.28	1.54
Science	15,579	3.30	1.56
Social Science	15,579	3.62	1.43
Visual and Performing Arts	15,579	3.94	1.33

*Note.* 1 = Very Important, 2 = Important, 3 = Somewhat Important, 4 = Of Little Importance, 5 = Not Important; *n* = 15,579.

## Discussion

### **Familiarity with Open Textbooks and Courseware**

This study sought to examine student familiarity with open textbooks and their perceptions of open textbook quality. Given that a large portion of the respondents (73%) reported never having heard of open textbooks, it was surprising to the researchers to find 61% offering a judgment of their value compared to commercial textbooks. Students, while not familiar with open textbooks before the survey, may have gained sufficient information from the survey itself to form an impression by the time they encountered this question, which was near the end of the survey.

The majority of students appear to be unaware of open courseware and its benefit to support their academic endeavors. Open courseware is a vast, rapidly expanding source of OER that appears to be going untapped by 90% of Florida higher education students, but the reasons are unclear from this research.

In contrast to students' minimal awareness, some research has shown faculty appear to be more aware of open courseware than are students (Florida Virtual Campus, 2012). Because the learning materials contained within an open course can be downloaded, used in whole or in part by anyone in the world, faculty may be using open courseware resources in their instruction without the students being aware that the material came from an open course.

### **Textbook Costs**

The high cost of textbooks, mounting student loan debt, the frustration of an unused required textbook, and the struggle to pass a course without owning the textbook combine to place an enormous burden on students. The prices students pay for textbooks are especially taxing. Fifty-four percent spent more than \$300 on textbooks during the Spring 2012 term and 19% spent over \$500. More than half of the respondents reported that none of their textbooks were paid by financial aid, and therefore they were required to have the means to charge or purchase textbooks at the beginning of each semester. Future research involving a reiteration of this survey instrument, after revisions, will examine more closely the reasons students' financial aid was not used for textbooks. Several universities and state higher education systems (e.g., Indiana University, California State University System) have negotiated textbook contracts with publishers to provide digital versions and print versions at a discount as a means of reducing textbook costs to their students. Faculty are also increasingly using OER in their instruction and finding innovative ways of teaching and learning without an assigned textbook (Ruth, n.d.; Weir, 2007), and many of these approaches are less costly for students.

#### ***Students' efforts to reduce cost***

Students reported exercising various options to reduce textbook expenditures, including purchasing books from a source other than the campus bookstore, renting textbooks, purchasing used books, selling their used books, and using copies on reserve at the campus library. Substantial portions (78%) of students reported venturing beyond the campus bookstore to purchase textbooks as a means to address cost. In addition to selling new and used print editions, buying back print editions, and selling Kindle edition of many of the textbooks used in higher

education, online retailer Amazon (“Amazon begins,” 2011) now offers Kindle rental options to students. Students can rent these Kindle ebooks from 30 to 360 days. The large portion of participants who reported they bought used books at the campus bookstore and sold used books indicate that the trade in used print books is still an important way for students to save money. The reported smaller proportion of students who have rented textbooks than the proportion willing to rent suggests that rental texts may not yet be widely available. One should note that renting textbooks precludes the opportunity for students to save by trading in used books.

### *Institutions’ efforts to reduce cost*

As mentioned previously, college and university administrations are examining alternatives such as rental options and bulk licensing of digital resources, which enable students to obtain digital versions at a discount. Should Florida institutions or the state implement bulk licensing textbooks, future research could examine whether there is a decrease in the numbers of students reportedly going outside of their institution for textbook purchases.

Several institutions are making open textbooks a viable option for addressing the increasing student financial costs of education. However, as more open textbooks have become available, it has become apparent that one-time grant money is not enough to sustain the currency of open textbooks or fund the development of additional ones. One solution to this problem being examined is to assess a student fee for courses using an open textbook. For example, the University of Florida Mathematics Department implemented a fee for courses using its Concepts in Calculus textbooks, a series of three open textbooks available online or through print-on-demand.

The findings from this study suggest that there is student support in Florida for an open textbook fee to fund the development and maintenance of open textbooks. There were 61% who selected “Yes” when asked whether they were willing to pay a course registration fee for use of an open textbook and 31% said “Maybe.” Future research examining the use of an open textbook fee in more depth could elicit information that could add to the understanding of student perceptions and potentially reduce the percentage of those responding with “Maybe.” Even though a definition of open textbooks was provided, comments from students who selected “Other” suggest that some participants were uncertain about the meaning of the definition. Students also had questions regarding open textbook quality in comparison to commercial products, whether they were to be used as a replacement for a commercial textbook, and their instructional use in a course. The preference for a print option was most frequently raised, calling attention to the need to provide students with format options rather than limiting print options to self-print capabilities. These comments demonstrated that some students clearly have a preference for reading print copies, lack digital readers or ready access to computers, and desire to highlight text. As suggested by one respondent, as with commercial products, there is a need for screen reader accessibility for open textbooks. Ways in which students’ lack of information and questions surrounding an open textbook fee could be addressed through awareness campaigns at institutions and providing information from student groups such as Student PIRGs.

Some higher education institution libraries are helping students address cost issues by providing students who cannot afford to purchase a textbook the opportunity to check out their required textbooks. One-fifth of the participants reported utilizing a library copy of their

textbook. However, a large number of students in this study reported they were unsure of the availability of library access to reserve copies of their textbooks (47%). While library textbook checkout has the potential to benefit students both financially and academically, it is unlikely that institution libraries have the space and staff to actually shelve print copies of all the textbooks used at an institution. Potential means by which this could be addressed include identifying publishers willing to provide free digital copies or assessing the financial viability of licensing single digital copies of textbooks assigned by instructors for the purpose of library checkout. It has been suggested that student use of digital books and digital textbooks holdings could, potentially, have a positive effect on student acceptance of digital textbooks and other digital resources (Mercieca, 2004). Further research is needed to examine what, if any, effect utilization of library digital books and textbooks has on student acceptance and use of digital textbooks.

### **Textbook Format and Feature Preferences**

Students still demonstrate a preference for buying print versions of textbooks, whether new or used, and experience with digital textbooks appears to be limited. However, there has been an increase in the reported digital textbooks purchases since the 2009 survey. Sixteen percent reported purchasing digital textbooks. Several factors point to increasing digital textbooks sales and their eventual dominance of the textbook market, including improvements of interactive features of software, portability of devices, and lower costs. Digital textbook vendors have been improving their products. These improvements have addressed many of the barriers to digital textbook use identified by students in this survey (e.g., highlighting text, adding comments). Vendors (e.g., CourseSmart, Follett's CafeScribe, Flat World Knowledge) are increasingly developing platforms on which students can highlight text and annotate their digital textbooks. Some platforms also allow students and faculty to share annotations. As students become aware of these developments, their attitudes toward digital textbooks may become more positive. Increased resolution in display technology such as iPad's Retina display and high-resolution display for phones may relieve the eye strain of reading digital text. Improved navigation interfaces such as the one Flat World Knowledge has introduced may ease the difficulties of moving within the text. Cost savings through bulk licensing at institutions could also be a motivating factor in selecting digital over print format.

### **Digital Access Term Lengths**

Student responses indicate many (70%) highly value having lifetime access to digital textbooks in their major area of study. Ways in which this desire for lifetime access could be addressed include publishers providing opportunities diverse rental time lengths as well as lifetime purchase options. As mentioned previously, online retailers such as Amazon are providing different rental lengths of its Kindle textbook editions. As an alternative to lifetime access, Indiana University has negotiated contracts with several publishers that provide their students access as long as they are enrolled in the university. Current and projected future increases in bulk licensing of digital textbooks, as in the subscription model, leads us to recommend that negotiators for institutions consider providing students the option to choose digital rental or lifetime access, with differential fees.

## **Digital Study Aid Preferences**

There was a difference in ranking by students and faculty of the digital aids that support student learning. The students perceived interactive practice questions, flash cards, and PowerPoint slide shows as more useful than the faculty. The faculty perceived video, animations, interactive ‘try it now’ activities, and online study groups as more useful than the students perceived them. The students and faculty did not significantly differ on their usefulness rankings of audio and online tutoring systems provided by the college (see Appendix, Section 21). The most commonly ranked study aids by both faculty and students for supporting student learning were interactive activities from which students can receive feedback on their performance.

For most subject areas, it is essential for learners to test and improve their knowledge and skills through practice and feedback; thus, when creating open textbooks, authors might wish to consider the production or acquisition of these study aids. At the current time, authors, support, and funding for the development of ancillary resources such as study aids, PowerPoint slides, and test banks are simply not available for every open textbook on the market. With this in mind, partnerships or bulk licensing of resources with commercial content providers could potentially address learning materials aligned with an open textbook (e.g., chemistry, algebra, biology). For example, WebAssign partnered with University Press of Florida to provide students with discounted access to their interactive platform. This was then utilized for the delivery of problem sets, links to the open textbook and supporting videos for calculus open textbooks. In addition, the utilization of publisher or vendor supplementary digital resources (e.g., videos) could be identified and licensed to support specific open textbooks.



## Conclusion

Textbooks currently play a significant role in the teaching and learning experiences in both the traditional and distance-learning classroom in higher education. The findings from this study and the literature suggest digital books and digital textbooks are dramatically gaining acceptance and it is expected their role will continue to increase over the coming years (Reynolds, 2011). A large proportion of students are addressing the high costs of textbooks by purchasing their books from sources other than their campus bookstore. It is unknown whether this will still be the case should more institutions and states explore bulk licensing as cost saving measures. When students do not read the assigned text, they are likely to fail (Sappington, Kinsey, & Munsayac, 2002). Textbook costs are clearly taking a toll on students both financially and academically. When students avoid or drop courses that require expensive textbooks, educational opportunities are lost. These losses may result in long-term costs to individual learners and ultimately to the competitiveness of the nation's economy.

Libraries can play an important role in the successful implementation of digital textbooks to foster a cost effective means for addressing student education. As this research demonstrates, institution libraries are providing a lifeline to some students who cannot afford to purchase a textbook, although nearly half the respondents did not know if their libraries offered textbooks for their use. It is important to note that student responses demonstrate that they want choices in the format and, in the case of their major area of study, lifetime access to digital textbooks.

As we look to the future, there are still many questions to be answered. How will textbook content be created and delivered, and what engagement capabilities need to be built into the content? Will students embrace a move to digital textbooks or will print still play the lead in format preference? How effective are open textbook fees in sustaining the development of high-quality open textbooks and OER? Will the open textbook become more interactive, as has its commercial counterpart, less a static file and more a collection of discreet units that can be remixed and used in a variety of textbooks?

A revised version of this survey will be administered in subsequent years to examine trends in students' behaviors, perceptions, and attitudes with regard to the evolving textbook. Florida Virtual Campus anticipates making the updated survey available for institutions outside of Florida for comparative analyses.

## References

- Amazon begins renting textbooks for Kindle. (2011, July 18). *USA Today*. Retrieved from [http://www.usatoday.com/tech/news/2011-07-18-amazon-kindle-college-textbooks\\_n.htm](http://www.usatoday.com/tech/news/2011-07-18-amazon-kindle-college-textbooks_n.htm)
- College Board. (2011). *Trends in college pricing 2011*. Retrieved from [http://trends.collegeboard.org/downloads/College\\_Pricing\\_2011.pdf](http://trends.collegeboard.org/downloads/College_Pricing_2011.pdf)
- Dennis, A. (2011). *E-Textbooks at Indiana University: A summary of two years of research*. Bloomington IN: Indiana University. Retrieved from <http://etexts.iu.edu/files/eText%20Pilot%20Data%202010-2011.pdf>
- Florida Virtual Campus (FLVC). (2012, July). *2012 Faculty and Administrator Open Educational Resources Survey*. Tallahassee, FL: Author.
- Mercieca, P. (2004). *E-book acceptance: What will make users read on screen?* Retrieved from the RMIT University Research Repository: <http://researchbank.rmit.edu.au/eserv/rmit:3208/n2004002718.pdf>
- Reynolds, R. (2011). *Digital textbooks reaching the tipping point in U.S. higher education*. Columbia, MO: MBS Service Company. Retrieved from <http://info.xplana.com/report/>
- Ruth, G. (n.d.) *No books, no problem: Teaching without a text*. Edutopia, The George Lucas Educational Foundation. Retrieved from: <http://www.edutopia.org/no-books-no-problem>
- Sappington, J., Kinsey, K., & Munsayac, K. (2002). Two studies of reading compliance among college students. *Teaching of Psychology*, 29, 272-274.
- Student PIRGs. (n.d.). Make textbooks affordable. Retrieved from <http://www.studentpirgs.org/textbooks/campaign>
- Weir, R. (2007). Teaching without textbooks. *Inside Higher Ed*. Retrieved from: <http://www.insidehighered.com/views/2007/03/06/weir>

## Appendix

### **Section 1: Demographics**

**Table A1**

***Descriptive Statistics for Participant Demographics***

Variable	<i>n</i>	%
Print Disability		
Yes	680	3.3
No	19,695	96.7
Read Digital Books for Personal Enjoyment		
Daily	1,558	10.0
At least once a week	1,818	11.7
At least once a month	1,585	10.2
A few times a year	3,126	20.1
Never	7,492	48.1
Familiarity With Open Textbooks		
I have never heard of open textbooks.	10,007	72.8
I have heard of open textbooks but never looked for any.	1,823	13.3
I've looked at some open textbooks.	997	7.2
I've used a part of or an entire open textbook in my course(s).	811	5.9
Other	115	0.8
Experience with Open Courseware		
I have never heard of it before.	9,366	68.2
I have heard of it, but not seen it.	1,611	11.7
I have visited one or more open courseware sites but have not used the material.	1,425	10.4
I have taken one or more courses.	1,331	9.7

## **Section 2: Textbook Finances**

**Table A2**

***Descriptive Statistics for Spring 2012 Textbook Finances***

Variable	<i>n</i>	%
Cost of textbooks for Spring 2012 term		
\$0 - \$100	1,915	9.8
\$101 - \$200	2,830	14.4
\$201 - \$300	4,034	20.6
\$301 - \$400	3,894	19.9
\$401 - \$500	3,004	15.3
\$501 – \$600	2,007	10.2
\$601 or more	1,662	8.5
Other	262	1.3
Percentage of textbooks costs covered by financial aid		
I do not receive financial aid	4,903	25.0
None	5,696	29.0
Less than 25%	1,103	5.6
26% - 50%	811	4.1
51% - 75%	578	2.9
\$76 – 99%	663	3.4
All of my textbooks costs	5,461	27.9
Other	393	2.0
Rent 1 or More Required Textbooks if it Saved Money		
Yes, either printed or digital	5,598	35.9
Yes, only if printed	5,495	35.3
Yes, only if digital	368	2.4
No	1,582	10.2
Maybe	2,536	16.3
Institution Library Provides Textbooks for Checkout		
Yes, in print format	4,263	29.0
Yes, in digital format	42	0.3
Yes, in both print and digital formats	2,103	14.3
I don't know	6,979	47.4
No	1,329	9.0
Willingness to Pay \$5-\$10 Registration Fee for Lifetime Access to Open Textbooks		
Yes	8,451	61.4
No	833	6.1
Maybe	4,274	31.1
Other	195	1.4

### **Section 3: Major Areas of Study**

**Table A3**

***Frequency of Students' Major Area of Study***

Major Area of Study	<i>n</i>	%
Agriculture, Agriculture Operations, and Related Sciences	276	1.2
Architecture and Related Services	147	0.7
Area, Ethnic, Cultural, Gender and Group Studies	94	0.4
Biological and Biomedical Sciences	1,449	6.5
Business, Management, Marketing and Related Support services	3,195	14.4
Communication, Journalism, and Related Programs	622	2.8
Communications Technologies/Technicians and Support services	94	0.4
Computer and Information Sciences and Support services	988	4.5
Construction Trades	54	0.2
Education	1,332	6.0
Engineering	1,560	7.0
Engineering Technologies and Engineering Related Fields	310	1.4
English Language and Literature/Letters	374	1.7
Family and Consumer Sciences/Human Sciences	80	0.4
Foreign Languages, Literatures, and Linguistics	215	1.0
Health Professions and Related Programs	2,888	13.1
History	261	1.2
Homeland Security, Law Enforcement, Firefighting and Related Protective Services	288	1.3
Legal Professions and Studies	687	3.1
Liberal Arts and Sciences, General Studies and Humanities	1,060	4.8
Library Science	15	0.1
Mathematics and Statistics	287	1.3
Mechanic and Repair Technologies/Technicians	17	0.1
Medical Science	1,275	5.8
Multi/Interdisciplinary Studies	83	0.4
Natural Resources and Conservation	102	0.5
Parks, Recreation, Leisure and Fitness Studies	98	0.4
Personal and Culinary Services	31	0.1
Philosophy and Religious Studies	83	0.4
Physical Sciences	279	1.3
Precision Production	3	0.0
Psychology	1,438	6.5
Public Administration and Social Service Profession	275	1.2
Social Sciences	730	3.3
Theology and Religious Vocations	19	0.1
Transportation and Materials Moving	10	0.0
Visual and Performing Arts	358	1.6
Technology Education/Industrial Arts	70	0.3

*Note: n = 20,376.*

## **Section 4: Cost Consequences**

**Table A4**

### ***Actions Taken as a Result of Textbooks Costs***

Action	Yes		No	
	<i>n</i>	%	<i>n</i>	%
Do not attempt to reduce textbook costs	510	2.7	18,077	97.3
Buy used copies from the campus bookstore	11,776	63.4	6,811	36.6
Buy books from a source other than the campus bookstore	14,557	78.3	4,030	21.7
Buy a digital version of a textbook	5,296	28.5	13,291	71.5
Buy only the digital textbook chapters needed for the course	1,386	7.5	17,201	92.5
Rent printed textbooks	7,722	41.5	10,865	58.5
Rent digital textbooks	1,818	9.8	16,769	90.2
Use a reserve copy from the campus library	3,807	20.5	14,780	79.5
Share books with classmates	8,058	43.3	10,529	56.6
Sell used books	12,282	66.1	6,305	33.9

*Note.* *n* = 18,587.

## **Section 5: Reasons for Possible Disinterest in Digital Textbooks**

**Table A5**

### ***Reasons for Lack of Interest in Using Digital Textbooks***

Reason	Yes		No	
	<i>n</i>	%	<i>n</i>	%
They are inconvenient to read.	9,057	61.2	5,731	38.8
I like to have a printed copy to write in and highlight text.	10,933	73.9	3,855	26.1
English is my second language. I am more comfortable with a print copy of a textbook.	737	5.0	14,051	95.0
It is difficult to move to different pages/sections of the book.	7,068	47.8	7,720	52.2
Some digital textbooks are not compatible with my print disability solutions.	935	6.3	13,853	93.7
Some digital e-reader devices are not compatible with my print disability solutions.	1,021	6.9	13,767	93.1
I do not have access to the technology to take advantage of digital textbooks.	2,453	16.6	12,335	83.4

*Note.* *n* = 14,788.

## **Section 6: Actions Taken to Reduce Costs**

**Table A6**

### ***Actions Taken As a Result of Textbooks Costs***

Action	Never		Seldom		Occasionally		Frequently	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Take fewer courses	9,441	50.8	2,675	14.4	4,390	23.6	2,069	11.1
Not register for a specific course	10,191	54.9	2,646	14.2	3,893	21.0	1,843	9.9
Drop a course	13,598	73.3	2,336	12.6	1,762	9.5	861	4.6
Withdraw from a course	14,714	79.3	2,013	10.8	1,194	6.4	632	3.4
Earn a poor grade because I could not afford to buy the textbook	12,262	66.1	2,932	15.8	2,404	13.0	959	5.2
Fail a course because I could not afford to buy the textbook	15,363	83.0	1,708	9.2	912	4.9	530	2.9
Not purchase the required textbook	6,726	36.4	2,730	14.8	4,843	26.2	4,170	22.6
Other	3,954	73.2	202	3.7	377	7.0	868	16.1

*Note: n = 18,587.*

## **Section 7: Academic Value of Open Resources**

**Table A7**

### ***Academic Value of Open Resources Compared to Commercial Publisher Resources***

Open Educational Resource	More Valuable		Similar in Value		Less Valuable		Don't Know	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Open textbooks	6,034	44.2	2,512	18.4	634	4.6	4,462	32.7
Other open educational resources	2,719	19.9	4,806	35.2	1,249	9.2	4,868	35.7
Open courseware	3,467	25.4	3,480	25.5	1,360	10.0	5,335	39.1

*Note: n = 13,642.*

## **Section 8: Textbook Access Methods for Spring 2012**

**Table A8**

### ***Textbook Access for Spring 2012***

Textbook Format	Yes		No	
	<i>n</i>	%	<i>n</i>	%
Print –New	7,961	57.9	5,792	42.1
Print –Used	10,201	74.2	3,552	25.8
Print –Borrowed (no cost)	2,232	16.2	11,521	83.8
Print –Rented	3,778	27.5	9,975	72.5
Checked out from the library or inter-library loan	923	6.7	12,830	93.3
Digital textbook – limited ownership license	2,204	16.0	11,549	84.0
Digital textbook – permanent access	1,156	8.4	12,597	91.6
Open textbook – online, download to personal computer, self-print	666	4.8	13,087	95.2
Open textbook – publisher bound and printed	226	1.6	13,527	98.4

*Note.* *n* = 13,753.

## **Section 9: Reasons for Using Open Courseware**

**Table A9**

### ***Reasons for Using Open Courseware Among Those With Open Courseware Experience***

Reason	Yes		No	
	<i>n</i>	%	<i>n</i>	%
Enrolled in a course that used all or part of the content from an open courseware	964	72.4	367	27.6
Preparation for taking a for-credit course	219	16.5	1,112	83.5
To gain qualifications or boost my career	129	9.7	1,202	90.3
To refresh or extend my knowledge of a subject I already know	294	22.1	1,037	77.9
Self-education or self-improvement	395	29.7	936	70.3
Curiosity	263	19.8	1,086	81.6
Other	57	4.3	1,274	95.7

*Note.* *n* = 1,331.



## **Section 10: Number of Open Courseware Courses Taken**

**Table A10**

*Number of Open Courseware Courses Taken Among Those With Open Courseware Experience*

Number of Open Courseware Courses Taken	<i>n</i>	%
Part of one	141	10.5
1	264	19.6
2 – 3	557	41.4
3 – 5	159	11.8
More than 5	223	16.6

Note: *n* = 1,344.

## **Section 11: Textbook Format Preferences**

**Table A11**

*Descriptive Statistics for Textbook Preferences*

Preference	<i>n</i>	median	mode
Rent a printed textbook for a semester	15,366	2.0	1.0
Rent a digital textbook for a semester	15,217	4.0	4.0
Rent a digital textbook for a semester with the option to purchase it during or after the rental period	15,028	3.0	3.0
Buy a printed textbook	14,969	2.0	1.0
Buy a digital textbook (permanent access)	15,036	4.0	5.0
Other	2,279	4.0	5.0

Note. 1 = Highest Preference, 5 = Lowest Preference; *n* = 1,344.

## **Section 12: Lifetime Access**

**Table A12**

***Importance of Having Lifetime Access to a Digital Version of Required Textbook***

Subject Area	<i>n</i>	<i>M</i>	<i>SD</i>
My major area of study	15,579	2.08	1.42
Business and Consumer Science	15,579	3.64	1.41
Communication and Information	15,579	3.61	1.40
Education	15,579	3.57	1.46
Engineering and Technology	15,579	3.66	1.48
Health Science	15,579	3.31	1.58
Humanities	15,579	3.73	1.38
Mathematics	15,579	3.43	1.53
Professional, Career, and Technical	15,579	3.28	1.54
Science	15,579	3.30	1.56
Social Science	15,579	3.62	1.43
Visual and Performing Arts	15,579	3.94	1.33

*Note.* 1 = Very Important, 2 = Important, 3 = Somewhat Important, 4 = Of Little Importance, 5 = Not Important; *n* = 15,579.

## **Section 13: Importance of Textbook Format**

**Table A13a**

***Importance of Textbook Formats Given Cost Is Not a Factor - Rating***

Textbook Format	Very Important		Important		Somewhat Important		Of Little Importance		Not Important	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Publisher bound and printed	9,098	58.5	3,375	21.7	1,414	9.1	732	4.7	943	6.1
Publisher bound and printed with companion website	5,853	37.6	3,842	24.7	2,786	17.9	1,577	10.1	1,509	9.7
Download and read on personal computer	2,954	19.0	3,039	19.5	4,166	26.8	2,975	19.1	2,419	15.6
Formatted for cell phone	1,677	10.8	1,476	9.5	2,324	14.9	3,306	21.3	6,767	43.5
Formatted for ebook reader (e.g. Kindle, iPad, other)	2,844	18.3	2,286	14.7	2,908	18.7	2,642	17.0	4,751	30.5
Formatted for print disabilities assistive technology	1,444	9.3	1,151	7.4	2,008	12.9	2,642	17.0	8,287	53.4
Read online (Internet access)	2,751	17.7	2,973	19.1	3,962	25.5	2,608	16.8	3,265	21.0
Audio version	1,651	10.6	1,519	9.8	2,393	15.4	3,060	19.7	6,936	44.6

*Note.* *n* = 15,567.

**Table A13b*****Importance of Textbook Formats Given Cost Is Not a Factor – Mean and Standard Deviation***

Textbook Format	<i>n</i>	<i>M</i>	<i>SD</i>
Publisher bound and printed	15,562	1.78	1.17
Publisher bound and printed with companion website	15,567	2.30	1.32
Download and read on personal computer	15,553	2.93	1.33
Formatted for cell phone	15,550	3.77	1.37
Formatted for ebook reader (e.g. Kindle, iPad, other)	15,567	3.28	1.48
Formatted for print disabilities assistive technology	15,532	3.98	1.34
Read online (Internet access)	15,559	3.04	1.38
Audio version	15,559	3.78	1.38

*Note.* 1 = Very Important, 2 = Important, 3 = Somewhat Important, 4 = Of Little Importance, 5 = Not Important; *n* = 15,579.

**Section 14: Preferences for Digital Features****Table A14*****Most Important Feature of a Digital Textbook***

Feature	<i>n</i>	median	mode
Text size control	9,412	3.0	1.0
Searching within the textbook	12,908	1.0	1.0
Copying and pasting	9,036	3.0	3.0
Adding notes	9,686	3.0	3.0
Self-printing at my own cost	6,545	4.0	5.0
Highlighting	8,286	3.0	3.0
Provides links to websites	4,077	4.0	4.0
Incorporates video	3,857	4.0	5.0
Incorporates interactive figures, diagrams, or images	6,245	3.0	4.0
Social bookmarking and commenting	2,996	5.0	5.0

*Note.* 1 = Most Important, 5 = Least Important; *n* = 14,734.

## Section 15: Digital Study Aids

**Table A15a**

***Most Useful Study Aids to Support Learning***

Feature	<i>n</i>	median	mode
Interactive practice questions	12,733	2.0	1.0
Flash cards	9,780	3.0	2.0
PowerPoint slide shows	10,704	3.0	3.0
Video	9,591	3.0	4.0
Audio	5,071	4.0	5.0
Animations	5,556	4.0	5.0
Interactive 'try it now' activities	8,445	3.0	4.0
Online study groups	3,618	5.0	5.0
Online tutoring system provided by the college	4,190	4.0	5.0

Note. 1 = Most Importance, 5 = Least Important; *n* = 14,045.

**Table A15b**

***Ranks of Most Useful Study Aids to Support Learning***

Digital aid	Rank				
	1 Most Important	2	3	4	5 Least Important
Interactive practice questions	<b>48.9% (6,230)</b>	21.9% (2,792)	14.4% (1,835)	8.8% (1,124)	5.9% (752)
Flash cards	17.8% (1,738)	<b>31.1% (3,037)</b>	19.4% (1,897)	15.7% (1,536)	16.1% (1,572)
PowerPoint slide shows	21.5% (2,302)	23.5% (2,519)	<b>26.8% (2,872)</b>	16.2% (1,735)	11.9% (1,276)
Video	12.3% (1,181)	18.5% (1,775)	23.7% (2,276)	<b>28.9% (2,774)</b>	16.5% (1,585)
Audio	4.7% (240)	11.7% (595)	18.2% (922)	26.0% (1,319)	<b>39.3% (1,995)</b>
Animations	5.8% (325)	12.2% (680)	21.9% (1,219)	28.9% (1,604)	<b>31.1% (1,728)</b>
Interactive 'try it now' activities	15.6% (1,315)	21.2% (1,792)	21.9% (1,851)	<b>23.7% (1,999)</b>	17.6% (1,488)
Online study groups	3.3% (119)	7.8% (283)	12.2% (443)	25.1% (908)	<b>51.5% (1,865)</b>
Online tutoring system provided by the college	10.3% (432)	12.9% (541)	16.5% (691)	23.7% (994)	<b>36.6% (1,532)</b>

Note. Boldface indicates highest frequency; *n* = 14,045.

## **Section 16: Textbooks Purchased in Spring 2012**

**Table A16**

### ***Descriptive Statistics for Textbooks Purchases***

Feature	<i>n</i>	Min.	Max.	<i>M</i>	<i>SD</i>
Textbooks Purchased for Spring 2012	19,420	0.0	15.0	3.65	2.16

*Note:*  $n = 19,608$ .

## **Section 17: Unused Required Textbooks**

**Table A17**

### ***Descriptive Statistics for Textbooks Purchases and Not Used***

Feature	<i>n</i>	Min.	Max.	<i>M</i>	<i>SD</i>
Required Textbooks Not Used	18,451	0.0	15.0	1.60	2.11

## **Section 18: Research Question 1: Degree Sought by Willingness to Rent**

*Research Question 1.* Is there a statistically significant relationship between the degree sought and the participants' willingness to rent one or more of their required textbooks if it saved money?

$H_0$ : There will not be a statistically significant relationship between the degree sought and the participants' willingness to rent one or more of their required textbooks if it saved money.

A chi-square test of independence was conducted to determine if there was a significant relationship between the degree sought and the participants' willingness to rent one or more of their required textbooks if it saved money. The observed and expected frequencies are listed in Table A18. The chi-square revealed a significant relationship between the two variables,  $\chi^2 (16) = 353.96, p < .01$ .

The data indicated that overall the students were not enthused about renting only a digital copy. The frequencies indicated those seeking an associate's degree were more likely to rent textbooks to save money (75.6%) than those pursuing a master's (65.9%) or doctorate degree (51.7%). Individuals seeking a doctorate degree (20.0%) were two times more likely *not to rent* textbooks to save money compared to those seeking an associate's degree (9.1%). Those seeking an associate's degree (24.4%) were less likely to say 'no' or 'maybe' to renting textbooks than those seeking a master's (34.1%) or doctorate degree (48.4%). The most common choice to the willingness to rent question among the doctorates was 'maybe' (28.4%).

Together these data are likely indicative of the graduate students' desire to keep rather than rent textbooks that are pertinent to their career and useful after graduation. Students seeking

undergraduate degrees may be more likely to sell their textbooks back to the bookstore or to another student after course completion because they are not particularly concerned about keeping a copy after graduation. For these students a rented copy may provide a cheaper alternative than buying and selling textbooks.

**Table A18**  
**Observed and Expected Frequencies for Research Question 1**

		Willingness to rent textbook if it save money					
Degree		Yes, either printed or digital	Yes, only if printed	Yes, only if digital	No	Maybe	Total
Associate	Observed	1,896	1,648	104	439	741	4,828
	Expected	1,740.6	1,708.9	112.7	483.9	781.9	
Bachelor (0 – 60 credits)	Observed	1,065	1,204	63	211	366	2,909
	Expected	1,048.7	1,029.6	67.9	291.6	471.1	
Bachelor (61+ hours)	Observed	1,945	1,970	121	556	884	5,476
	Expected	1,974.2	1,938.2	127.9	548.9	886.9	
Masters	Observed	408	388	48	172	265	1,281
	Expected	461.8	453.4	29.9	128.4	207.5	
Doctorate	Observed	182	186	20	150	213	751
	Expected	270.7	265.8	17.5	75.3	121.6	
Total	Observed	5,496	5,396	356	1,528	2,469	15,245

Note: n = 15,579.

## **Section 19: Research Question 2: Degree Sought by Willingness to Pay Open Textbook Fee**

*Research Question 2.* Is there a statistically significant relationship between the degree sought and the participants' willingness to pay a course registration fee between \$5 and \$10 for lifetime access to open textbooks?

H<sub>0</sub>: There will not be a statistically significant relationship between the degree sought and the participants' participants' willingness to pay a course registration fee between \$5 and \$10 for lifetime access to open textbooks.

A chi-square test of independence was conducted to determine if there was a significant relationship between the degree sought and the participants' willingness to pay a course registration fee between \$5 and \$10 for lifetime access to open textbooks. The observed and expected frequencies are listed in Table A19. The chi-square revealed a significant relationship between the two variables,  $\chi^2(8) = 30.92, p < .01$ .

Overall the data indicated that the participants were willing to pay the registration fee for permanent access to their open textbooks. Those who did not answer 'yes' were most likely to answer 'maybe,' indicating an openness to the idea of open textbooks. A comparison of the group data indicated that the higher education levels (64.3% - 64.7%) were more likely to say 'yes' to paying a registration fee for permanent access to their open textbooks than those seeking an associate's degree (59.6%). Together these data show a different pattern than revealed in research question 1. The main difference between the two survey questions was the ability of the students to keep a permanent copy rather than rent their textbooks. This may be especially important for those seeking higher levels of education because of the pertinence of the textbook materials to their career.

**Table A19*****Observed and Expected Frequencies for Research Question 2***

Degree		Willingness to Pay Registration Fee for Permanent Access			Total
		Yes	No	Maybe	
Associate	Observed	2,461	269	1,401	4,131
	Expected	2,579.0	253.2	1,298.8	4,131.0
Bachelor (0 – 60 credits)	Observed	1,536	150	816	2,502
	Expected	1,562.0	153.4	786.7	2,502.0
Bachelor (61+ hours)	Observed	3,120	288	1,417	4,825
	Expected	3,012.2	295.8	1,517.0	4,825.0
Masters	Observed	739	63	348	1,150
	Expected	717.9	70.5	361.6	1,150.0
Doctorate	Observed	424	43	188	655
	Expected	408.9	40.2	205.9	655.0
Total	Observed	8,280	813	4,170	13,263

Note:  $n = 13,753$

### **Section 20: Research Question 3: Unused Required Textbook by Degree Sought**

*Research Question 3.* Is there a significant difference on the number of required books that were purchased but not used in class by degree sought (associates, bachelors 0 – 60 credits, bachelors 61+ credits, masters, doctorate)?

$H_0$ : There will not be a significant difference on the number of required books that were purchased and not used in class by degree sought.

A one-way ANOVA (analysis of variance) was conducted to address research question 3. Degree sought was the between-subjects independent variable, and the number of required books not used was the dependent variable. The large sample size in each group allowed the researcher to use the central limit theorem to assume normality of group sampling distributions of the means. Levene's test was significant, indicating heterogeneity of variances.

The descriptive statistics by group are listed in Table A20. The ANOVA (Table A21) revealed a significant difference among the degree groups on the number of required books



purchased but not used in class,  $F(4, 18025) = 72.82, p < .01 (\eta^2 = .02, \text{power} = 1.00)$ . However, the effect size was small despite the statistically significant effect. Only 2% of the variability in books purchased but not used was attributed to the degree sought.

**Table A20a**  
**Means and Standard Deviations for Research Question 3**

Degree Sought	<i>n</i>	<i>M</i>	<i>SD</i>
Associate's	5,899	1.33	1.68
Bachelor's (0-60 credits)	3,489	1.58	1.81
Bachelor's (61+ credits)	6,330	1.96	2.54
Master's	1,460	1.46	2.16
Doctorate	852	1.47	2.14

Note:  $n = 18,587$ .

**Table A20b**  
**One-way ANOVA for Research Question 3**

Source	<i>SS</i>	<i>df</i>	Mean Square	<i>F</i>	<i>Sig.</i>
Between Groups	1,287.41	4	321.85	72.82	.000
Within Groups	79,668.28	18,025	4.42		
Total	128,249.00	18,030			

Bonferroni post-hoc tests (Table A22) were conducted to further investigate the significant ANOVA. The post-hoc tests revealed many significant differences. The bachelor degree (61+ credits) group bought significantly more required texts not used than the other five groups. The largest difference was between the bachelor (61+ credits) degree group ( $M = 1.96, SD = 2.54$ ) and the associates degree group ( $M = 1.33, SD = 1.68$ ). Another notable finding was the non-significant differences between the associate's degree and graduate level degrees on the number of required text purchased but not used. Overall, the ANOVA effect was significant but small, and the data shows that those seeking a bachelor's degree (61+ credits) are most likely to deal with unused required texts.

**Table A20c**

**Bonferroni Post Hoc Tests for Research Question 3**

(I) Degree	(J) Degree	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower	Upper
Associate's	Bachelor's (0 - 60 credit)	-0.25	0.04	.000	-0.37	-0.12
	Bachelor's (61+ credits)	-0.63	0.04	.000	-0.74	-0.52
	Master's	-0.13	0.06	.370	-0.30	0.04
	Doctorate	-0.13	0.08	.843	-0.35	0.08
Bachelor's (0 - 60 credit)	Associate's	0.25	0.04	.000	0.12	0.37
	Bachelor's (61+ credits)	-0.38	0.04	.000	-0.50	-0.26
	Master's	0.12	0.07	.669	-0.06	0.30
	Doctorate	0.12	0.08	1.00	-0.11	0.34
Bachelor's (61+ credits)	Associate's	0.63	0.04	.000	0.52	0.74
	Bachelor's (0 - 60 credits)	0.38	0.04	.000	0.26	0.50
	Master's	0.50	0.06	.000	0.33	0.67
	Doctorate	0.50	0.08	.000	0.28	0.71
Master's	Associate's	0.13	0.06	.370	-0.04	0.30
	Bachelor's (0 - 60 credits)	-0.12	0.07	.669	-0.30	0.06
	Bachelor's (61+ credits)	-0.50	0.06	.000	-0.67	-0.33
	Doctorate	-0.00	0.09	1.00	-0.26	0.25
Doctorate	Associate's	0.13	0.08	.843	-0.08	0.35
	Bachelor's (0 - 60 credits)	-0.12	0.08	1.00	-0.34	0.11
	Bachelor's (61+ credits)	-0.50	0.08	.000	-0.71	-0.28
	Master's	0.00	0.09	1.00	-0.25	0.26

Note: n = 18,587.

**Section 21: Research Question 4: Usefulness of Digital Study Aids by Group**

*Research Question 4.* Are there statistically significant differences between the faculty and students on their usefulness rankings of the following study aids to support student learning: interactive practice questions, flash cards, PowerPoint slides, video, audio, animations, interactive 'try it now' activities, online study groups, online tutoring system provided by the college?

H<sub>0</sub>: There will not be significant differences between the faculty and students on their usefulness rankings.

H<sub>A</sub>: There will be significant differences between the faculty and students on their usefulness rankings.

Several Mann-Whitney tests were conducted to determine if there were significant differences between the faculty and students on their usefulness rankings of the study aids. The descriptive statistics and Mann-Whitney statistics are listed in Tables A21a and A21b, respectively. The tests revealed significant differences on the usefulness rankings for 7 of 9 study aids. The students perceived interactive practice questions, flash cards and PowerPoint slide shows as *more useful* than the faculty. The faculty perceived video, animations, interactive ‘try it now’ activities and online study groups as *more useful* than the students. The students and faculty did not significantly differ on their usefulness rankings of audio and online tutoring systems provided by the college.

**Table A21a**

***Descriptive Statistics for Study Aids Rankings by Group***

Study Aid	Group	<i>n</i>	Median	Mean Rank	Sum of Ranks
Interactive practice questions	Faculty	1,292	2.0	<b>7,470.43</b>	<b>9,651,802</b>
	Student	12,733	2.0	<b>6,966.58</b>	<b>88,705,523</b>
	Total	14,025	2.0		
Flash cards	Faculty	532	4.0	<b>7,117.79</b>	<b>3,786,663</b>
	Student	9,780	3.0	<b>5,049.81</b>	<b>49,387,165</b>
	Total	10,312	3.0		
PowerPoint slide shows	Faculty	1,025	3.0	<b>6,268.46</b>	<b>6,425,167</b>
	Student	10,704	3.0	<b>5,826.37</b>	<b>62,365,417</b>
	Total	11,729	3.0		
Video	Faculty	1,115	3.0	<b>4,654.90</b>	<b>5,190,208</b>
	Student	9,591	3.0	<b>5,434.72</b>	<b>52,124,363</b>
	Total	10,706	3.0		
Audio	Faculty	455	4.0	2,635.19	1,199,011
	Student	5,071	4.0	2,775.01	14,072,090
	Total	5,526	4.0		
Animations	Faculty	604	3.0	<b>2,707.42</b>	<b>1,635,280</b>
	Student	5,556	4.0	<b>3,121.06</b>	<b>17,340,600</b>
	Total	6,160	4.0		
Interactive ‘try it now’ activities	Faculty	1,086	2.0	<b>3,953.76</b>	<b>4,293,780</b>
	Student	8,445	3.0	<b>4,870.45</b>	<b>41,130,966</b>
	Total	9,531	3.0		
Online study groups	Faculty	557	4.0	<b>1,816.16</b>	<b>1,011,603.50</b>
	Student	3,618	5.0	<b>2,129.85</b>	<b>7,705,796.50</b>
	Total	4,175	4.0		
Online tutoring system provided by the college	Faculty	520	4.0	2,325.17	1,209,090.50
	Student	4,190	4.0	2,359.26	9,885,314.50
	Total	4,710	4.0		

Note: *n* = 14,045.

**Table A21b*****Mann-Whitney Statistics***

Open Educational Resource	Mann-Whitney <i>U</i>	<i>z</i>	Sig.
Interactive practice questions	7,634,512.00	-4.56	.000
Flash cards	1,558,075.00	-16.00	.000
PowerPoint slide shows	5,072,257.50	-4.09	.000
Video	4,568,038.00	-8.18	.000
Audio	1,095,271.00	-1.87	.061
Animations	1,452,570.00	-5.61	.000
Interactive 'try it now' activities	3,703,539.00	-10.56	.000
Online study groups	856,200.50	-6.18	.000
Online tutoring system provided by the college	1,073,630.50	-0.56	.576



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