Scholarly Reading by Undergraduate Students in the United States: Summary Results of a Study Conducted in 2012 in Three Universities

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Executive Summary

The Lib-Value project measures the value, outcomes, and return on investment of academic library collections and services. This report measures the value of the library collections by examining the scholarly reading patterns of undergraduate students in the United States and comparing their use of the library with other sources for scholarly materials.

Starting in February 2012 through October 2012, undergraduate students at three universities in the United States were invited to participate in a survey of their scholarly reading behavior. We received 800 responses from a total undergraduate population of 51,364 for a response rate of 1.6%. Any conclusions must be made cautiously due to this low response rate. The survey asked questions about reading of articles, books, and other scholarly materials from all sources (library-provided, other sources, and social media), and focused on use value (outcomes of reading) and exchange value (time spent obtaining and reading).

Important findings include:

- Thirty-six percent of article readings by undergraduate students are reported to be obtained from a library or school/department subscription and 90% of those obtained through the library or school/department are from electronic collections.
- Undergraduate students may not be aware that many of the articles they obtain online are from a library-provided subscription.
- Younger students are more likely to read in an electronic format – 81-76% of the article readings by students in their early twenties are read in an electronic format. Only 69-60% of the readings by students 24 years and older are read in an electronic format.
- Undergraduate students are more likely to purchase books (66%) than obtain them from the library (15%).
- The majority of article readings and book readings are required readings (21% articles and 68% books) or to help complete assignments (48% articles

and 18% books); however, article readings (16%) are more likely than scholarly book readings (7%) to be read just for personal interest.

- Undergraduate students participate in social media more than they create it; however, on average their use and creation is more often occasional rather than on a regular basis.
- Undergraduates who participate in or create content for social media tools read more scholarly articles and books.
- United States undergraduate students on average spend approximately 60 hours per year of their 9 month work time with library-provided material, or the equivalent of 7.5 eight-hour days annually.

Introduction

The project in context: previous studies and methodology

Undergraduate students now have many choices of where and how to access scholarly articles, books, or other materials. In order to determine the best method to provide undergraduate students with scholarly material, this study seeks to answer the questions: How does the library role and value compare to the role and value of other sources for scholarly readings? Why do undergraduate students read scholarly materials? Do reading patterns vary according to purpose of reading, source of reading, or individual characteristics of readers such as academic discipline, status, or age? How do the reading patterns of undergraduate students differ from graduate students or faculty members? What is the role and value of the academic library in providing access to scholarly content in a changing digital landscape?

The Value, Outcome, and Return on Investment of Academic Libraries project (Lib-Value) is a three-year study funded by the Institute of Museum and Library Services (IMLS). Part of the project seeks to measure the value of access to scholarly materials by examining scholarly reading patterns and comparing use patterns of the library-provided resources with the use of scholarly materials accessed from other sources. Faculty members, graduate students, and undergraduate students were studied at several universities. Seton Hall University, University of Colorado (Boulder), the University of Tennessee (Knoxville), and two universities in Australia – University of South Wales and the University of Queensland-- participated in the surveys of undergraduate students. This report focuses on the results from the survey of undergraduate students from the three US universities combined results.

The Lib-Value project is led by a research team at the University of Tennessee, the University of Illinois at Urbana-Champaign (UIUC), Syracuse University, and the Association of Research Libraries (ARL).

Previous Studies

Since 1977, Tenopir and King have conducted reading surveys of scientists and faculty in the university and non-university setting (King et al. 1981; Belefant-Miller and King 2001). In 2003 these surveys were expanded to include undergraduate science students' electronic journal reading patterns as part of an NSF-funded National Science Digital Library project (Tenopir 2003). The study found that undergraduate students turn to electronic sources first, in particular the Web, for their coursework, and requirements in their courses and instructions from professors guide their understanding and use of scholarly journals (Madden and Jones 2002; Tenopir et al. 2003).

Recent studies have shown that undergraduate students often use the sources that are most convenient to them, rather than those that are of the highest quality (Tenopir 1999). Easy availability of full-texts of articles is the most important deciding factor for undergraduates when selecting a digital resource for research (Tenopir 1999). In 2004-2006, Tenopir and King conducted reading surveys of graduate and undergraduate students in the United States, Australia, Finland, and Japan (Tenopir et al. 2010). The surveys found that lower-division undergraduate students often do not use scholarly articles unless specifically required for an assignment, although upper-division undergraduates writing a thesis report using more articles (Wolverton and Tenopir 2006). The majority of these articles were from e-journals; in all cases, students recognized

convenience as a factor in using electronic resources. The earlier studies focused on scholarly article readings and the use of e-journals, while this study expands the scope to include scholarly book readings and social media.

Many recent studies have reported on the future of e-books in academia. A 2009 CIBER report found that nearly two-thirds of teaching staff and students in the United Kingdom have used an e-book to support their work or study or for leisure purposes, and more than half of users said the last e-book they used was provided by their university library. A study at the Health Sciences Library System at Pittsburgh University discovered that over half the surveyed faculty, graduate students, and undergraduate students used library provided e-books for their job duties, and it concluded that respondents are willing to use alternative formats (Folb et al. 2011). Another study at the University of Illinois in 2008 shows that faculty, graduate students, and undergraduate students value the convenience and time saving capabilities this format offers them, as well as the ability to search full-text content of e-books but there are still disadvantages with its format on the screen (Shelburne 2009). Many other studies have reported similar findings, showing that e-books are becoming a valuable library resource (Chrzastowski 2011; Tenopir et al. 2012).

Methodology

This study examines the reading of scholarly articles, books and book chapters and the use and creation of social media. The survey maintained a consistent core of questions and maintained similar questions in each section in order to compare results with earlier reading surveys. The questions are based on two principal sections—reader-related and

reading-related. Reader-related questions focus on the demographics of the respondent, including age, gender, and major.

The reading-related questions mostly use the "critical incident technique" first developed by Flanagan (1954). The *critical incident technique* has since been applied to many contexts, including libraries and readings (Radford 2006; Andrews 1991). The survey used the last scholarly reading as the critical incident of reading (Griffiths and King 1991). By asking about a specific most recent reading, respondents should have a better memory of that reading, rather than having to reflect back on multiple readings over a longer period of time. While the last reading may not be representative of a typical reading, it allows us to find details and patterns of reading and use. The questions cover many details of that reading, including time spent on the reading, source of reading, purpose of reading, and value of the reading to the purpose. A complete survey instrument is found in the appendix of this report.

Starting in February 2012 through October 2012, an e-mail message was sent by librarians to approximately 51,364 undergraduate students at three universities in the United States (Table 1). The message included an embedded link to a survey housed on the University of Tennessee's server. We received 800 responses for a response rate of 1.6%.[1]

Table 1. Response Rates of Participating US Institutions

Institution	Responses	Total Undergraduate Students	Response Rate
Seton Hall University	149	5000	2.9%
University of Colorado	139	24,757	0.6%
University of Tennessee, Knoxville	512	21,607	2.4%

[1] Assumes all invitations were sent to valid and active email addresses.

The low response rate may make it hard to generalize across the population, and while our results are not weighted, weighting the results may help improve the generalizability of the responses. Since respondents were allowed to leave the survey at any time, skip questions, or were timed out automatically if they began the questionnaire and did not complete it, most of the questions have a lower number of responses. All respondents for a particular question equal 100% for that question.

Demographics of Respondents

Academic Major

Undergraduate students were asked to list their major. For analysis, we collapsed the majors into six categories (Table 2). Fine arts were combined with humanities; psychology, business, and education were combined with social sciences. One-third of the respondents are in the social sciences; 22% are in the sciences, 13% are in the humanities, 9% are in the medical sciences, and 8% are in engineering/technology/math fields. The remaining "other" disciplines are interdisciplinary fields (i.e., College Scholars, interdisciplinary) or disciplines that did not clearly fit into one of the larger categories (e.g., agricultural leadership).

Table 2. Academic Disciplines of US Undergraduate Student Respondents

	Frequency	**Percent**
Sciences	113	21.6
Medical Sciences	48	9.2
Engineering/ Technology/Math	43	8.2
Social Sciences	172	32.9
Humanities	67	12.8
Others	80	15.3
Total	523	100.0

Status, Age, and Gender

We asked the respondents for their year of study (Table 3). Each class was represented in the responses. Thirty-one percent of the undergraduate students are in their senior year; 24% in their junior year; 19% in their sophomore year; and 23% in their freshman year. Three percent of undergraduate students are in an "other" category, which include fifth and sixth year seniors and students seeking a second degree. Nearly all (93.7%, 490 of 523) of the respondents are full-time students.

Table 3. Academic Status of US Undergraduate Student Respondents

	Frequency	Percent
Freshman	123	23.3
Sophomore	99	18.8
Junior	124	23.5
Senior	165	31.3
Other	16	3.0
Total	527	100.0

The majority of respondents are under twenty-three years of age (Table 4). Only 8% are over thirty years of age.

Table 4. Age Range of US Undergraduate Student Respondents

	Frequency	Percent
Under 20	185	35.4
20 ~ 23	255	48.9
24 ~30	38	7.3
Over 30	44	8.4
Total	522	100.0

Freshman respondents are nearly all under twenty years (96%, 117 of 122), while 62% of sophomores are under twenty (61 of 98) and 30% are between twenty and twenty-three years of age (29). Eighty-two percent of juniors (100 of 122) are between twenty and twenty-three and 13% are at least 24 (16). Seventy-two percent of seniors (117 of 163) are primarily between twenty and twenty-three years of age. The majority (55%) of the respondents over thirty years of age are seniors (24 of 44). Of the respondents, 70% are female (Table 5).

Table 5. Gender of US Undergraduate Student Respondents

	Frequency	Percent
Male	160	30.5
Female	365	69.5
Total	525	100.0

There are some differences based on discipline (χ^2=34.061, p<.0001). Female students account for the majority of students in all disciplines except engineering/technology/math fields. Over half (54%) of engineering/technology/math students are male, while 47% are female.

Information Sources Used

We asked, "*What sources did you use the last time you needed important information?*" Respondents could select more than one answer. Websites, journal articles, and book/book chapters are popular sources for information (Table 6). Respondents sought information from an instructor (41%) or a friend (20%) more often than a librarian (12%). The other sources for information include: Google, newspapers, government agencies, NPR, family, and databases.

Table 6. Information Sources Used by US Undergraduate Student Respondents*

	Frequency	Percent
Web site	445	84.3
Journal article	354	670
Book or book chapter	286	54.2
An instructor	217	41.1
A friend or someone I know	106	20.1
Magazine article	87	16.5
A librarian	65	12.3
Other	21	4.0
Total	528	

*Respondents could select more than one.

Students in all disciplines most frequently refer to websites, followed by journal articles, and then book/book chapters for information.

Scholarly Journal Article Reading

Total Amount of Article Reading

An initial step in exploring journal article reading patterns is determining the total number of article readings per student. To improve the accuracy of their response and minimize the inherent bias of self-reporting, we asked for a relatively short period of time (one month) rather than asking the respondents to reflect back over a longer period of time and we define the key terms very specifically. We distributed the survey in November, and we assume the last month is an accurate representation of a typical month of reading. The first question stated, "*In the **past month (30 days),** approximately how many scholarly articles have you read? (Articles can include those found in journal issues, Web sites, or separate copies such as preprints, reprints, and other electronic or paper copies. Reading is defined as going beyond the table of contents, title, and abstract to the body of the article)*." The actual number is less important than the relative amounts among types of respondents and over time. For convenience, we often report results from faculty and graduate students as readings per year, by taking the monthly number reported by the respondent and multiplying it by 12. Since undergraduate students who do not take summer school classes are unlikely to read as many scholarly articles in the summer, multiplying by 9 or 10 months may be more realistic.

As expected, there is a wide-range of responses, with students reporting from zero to 200 readings in the past month. Only 8% of the respondents did not report any article readings in the past month, and over one-quarter (28%) report more than fifteen readings (Table 7). In the last month, the United States undergraduate students report reading an average of fifteen articles (M=14.52, SD=19.928).[2] Zero readings are included in the

[2] Excludes two outliers over 200. Including outlier the mean is 15.99.

average. Extrapolated to the academic year, the average undergraduate student reads 135 articles in a nine-month year.

Table 7. Number of Article Readings by US Undergraduate Students

Article Readings Per Month	Frequency	Percentage
0	64	8.0
1 - 15	512	64.3
16 - 30	149	18.7
31 - 45	21	2.6
46 - 60	29	3.6
Over 60	21	2.6
Total	796	100.0

On average, the majority of the respondent's readings are for a class (Table 8). Seventy-one percent of the respondents read over half of the articles for a class (510 of 722), and only 17% of the respondents read less than one-quarter or less of the articles for a class (120).

Table 8. Percent of Article Readings for Class by US Undergraduate Students

Percent of readings for class	Frequency	Percentage
0-25%	120	16.6
26 ~50%	92	12.7
51 ~ 75%	82	11.4
>75%	428	59.3
Total	722	100.0

Regardless of students' majors, the majority of readings are for class (approximately 67-78%). Engineering/Computer/Math students read less for class (M=67%). "Other" majors read 78% for class, followed by medical science majors 77%, humanities majors (75%), social science majors (75%), and science majors read 68% for class. "Other" status students read slightly more articles outside of class (F=.466, p=.761). On average, 77% of readings by freshman, 73% by sophomores, juniors, and seniors are read for class.

Last Incident of Reading and Date of Publication

The next set of questions asked students to focus on the last scholarly article they read. This variation of the critical incident technique assumes the last article reading is random and provides detailed information on a random sample of the readings by undergraduate students. We asked, "*The following questions in this section refer to the SCHOLARLY ARTICLE YOU READ MOST RECENTLY, even if you had read the article previously. Note that this last reading may not be typical, but will help us establish the range of reading patterns*." We then asked for the title or topic of the journal article from which the last reading took place in order to focus their minds on the article for the rest of the critical incident questions.

Slightly over one-quarter (28%) of the article readings by graduate students in the United States are in the first ten months of publication, and to see how undergraduate students compared we asked, "*What year was the last article you read published/posted*?" Similarly, we found 31% of the readings are within the first ten months of publication (Table 9). The year of publication ranges from 1845 to 2013 with 12% of the articles fifteen-years-old or older.

Table 9. Age of Article Readings by US Undergraduate Students

Year	Frequency	Percentage
Over 15 years (Before 1997)	60	12.0
11 ~ 15 years (1997-2001)	24	4.8
6 ~ 10 years (2002-2006)	76	15.3
2 ~ 5 years (2007-2010)	128	25.7
One year (2011)	55	11.0
Less than 1 year (2012)	155	31.1
Total	498	100.0

Faculty members in the United States report more article readings in the first year of publication (39%, 247 of 628) than undergraduate students (31%, 155 of 498) or graduate students (21%, 202 of 958). Graduate students report the highest percentage of readings over five-years-old (35%, 332), while 32% of readings by undergraduate students (160) are over five years old. Faculty members (24%, 150) report the least amount of readings over five years old.

Thoroughness of Last Article Reading and Time Spent Reading

Since this is a random sample of article readings, the article may have been previously read. For undergraduate students in the United States, however, the majority (93%, 495 of 530) of the article readings are first time readings.

Economist Fritz Machlup described two types of value in the information context: *purchase or exchange* value and *use* value (1979). Time spent represents an *exchange value,* assuming scholars spend a large portion of their work time on reading because they

consider it valuable. In order to get an indication of the exchange value of reading, we asked students to describe the thoroughness of their last scholarly article reading and how much time they spent on the reading. Eighty-six percent of the readings are read with great care and attention to all or parts of the article. Only 6% of the readings are reported to be skimmed (Table 10).

Table 10. Thoroughness of Last Article Reading by US Undergraduate Students

	Frequency	**Percent**
I read all of it with great care	153	27.6
I read parts of it with great care	176	31.7
I read it with attention to the main points	150	27.0
I read only specific sections	43	7.7
I skimmed it just to get the idea	33	5.9
Total	555	100.0

Another aspect of the thoroughness of the article reading is the amount of time spent per reading. The average time spent per reading is twenty-eight minutes (M=27.68, SD=25.781)[3] with a range of two minutes to three hours and 20 minutes. Only 6% of readings are over an hour (Table 11).

Table 11. Average Time Spent Per Article Reading by US Undergraduate Students

Minutes	**Frequency**	**Percent**
1-10	140	26.6
11-30	270	51.2
31-60	87	16.5
61-90	16	3.0
Over 90	14	2.7
Total	527	100.0

[3] Excludes outliers over 200. Including the outliers, the mean is 30.04.

Undergraduate students in the United States spend less time, on average, on each article reading than graduate students or faculty members. The average time spent per article reading by graduate students was forty-one minutes while faculty members spend thirty-three minutes.

Source of Article

An important part of our analysis of undergraduate student reading patterns is determining how they become aware of articles. In the survey, we asked, "*How did you or someone on your behalf become aware of this last article you read?*" There are many ways to become aware of articles, and their answers reflect their myriad options (Table 12). We followed up the question by asking what source they searched or browsed, indicating whether it was a print or electronic source. For the purposes of the survey, we defined browsing as "without a specific objective in mind" and searching as having some sort of starting point such as author's name or by subject. We included a "don't know/don't remember" option for those who may not remember how they became aware of the article.

Approximately a third (32%) of the readings are found through searching, and a quarter (26%) are found through browsing. The other sources of browsing are include databases, a mobile app, Facebook, Google Scholar, magazine, and Yahoo's front page. Another 41% of the readings are found through one of the other listed methods, including a citation, an instructor, or course outline/reading list. Other sources to become aware of readings include physically receiving it from a professor, cited in a lecture, Google Scholar, email list, club or group study, databases, news, Facebook, a subscription, and work discussion.

Table 12. How US Undergraduate Students Initially Become Aware of Articles

	Frequency	Percent
Browsing[4]	140	25.8 (100.0)
1. Print library subscription	(5)	(3.7)
2. Electronic library subscription	(32)	(23.5)
3. Print personal subscription	(7)	(5.1)
4. Electronic personal subscription	(8)	(5.9)
5. Web site	(53)	(39.0)
6. Print school, department subscription	(8)	(5.9)
7. Electronic school, department subscription	(12)	(8.8)
8. Other	(11)	(8.1)
Searching[5]	178	32.8 (100.0)
1. Databases on the library website	(103)	(58.5)
2. Web search engine	(60)	(34.1)
3. Online journal collection	(11)	(6.3)
4. Print index or abstract	(0)	(0)
5. Other	(2)	(1.1)
Other	(224)	(41.3)
1. Cited in another publication	21	3.9
2. An instructor told me about it	73	13.5
3. Course outline/reading list	81	14.9
4. Don't know /don't remember	3	0.6
5. Other	46	8.5
Total	542	100.0

Nearly all (99%) of the articles found through searching and 77% of articles found by browsing are from an electronic source. Over half (59%) of the articles found through searching are found through the library website; 34% are found through a web search engine, and 6% are found through an online journal collection. Respondents browse many sources, including websites (39%), electronic library subscriptions (24%), electronic and

[4] Of the 140 respondents who selected "browsing," only 136 answered the accompanying question which specified their browsing method.
[5] Of the 178 respondents who selected "searching," only 176 answered the accompanying question which specified their searching method.

print school/department subscriptions (15%), and electronic and print personal subscriptions (11%).

Obtaining the Article

Once undergraduate students become aware of an article, they must choose a source to obtain it. Twenty-three percent of article readings are reported to be obtained from a library subscription and 13% are from a department/school subscription (Table 13). In many cases the articles, which students thought were from a department/school subscription, may actually be from a library subscription, so for our analysis we combined the library and school/department subscription responses.[6] Undergraduate students also obtain articles from free web journals (23%) and websites (12%). Other sources where students obtain articles are not always clear, but include Google Scholar, Blackboard, JSTOR, and newspaper websites. Of course many of these sources are also obtained due to linking from the library subscriptions. Undergraduate students therefore likely under estimate the number of e-readings that come from the library.

[6] We assume the number of articles from a library/school/department subscription is in fact higher because students are confusing what's "free on the web" with what is actually from the library.

Table 13. How US Undergraduate Students Obtain Articles

	Frequency	**Percent**
Personal subscription	19	3.6 (100.0)
• Print	(12)	(63.2)
• Electronic	(7)	(36.8)
Library subscription	122	23.0 (100.0)
• Print	(10)	(8.2)
• Electronic	(112)	(91.8)
Department/school	67	12.6 (100.0)
• Print	(8)	(11.9)
• Electronic	(59)	(88.1)
Free Web journal	120	22.6
Copy from a colleague, instructor, author, etc.	66	12.4 (100.0)
• Print	(17)	(25.8)
• Electronic	(49)	(74.2)
Interlibrary loan or document delivery service	4	0.8 (100.0)
• Print	(3)	(75.0)
• Electronic	(1)	(25.0)
An author's website	10	1.9 (100.0)
Course reserves	24	4.5 (100.0)
• Print	(3)	(12.5)
• Electronic	(21)	(87.5)
Other website	65	12.2
Other source	34	6.4(100.0)
• Print	(9)	(27.3)
• Electronic	(24)	(72.7)
Total	531	100.0

The majority of article readings by undergraduate students in the United States are obtained from an electronic source (88%, 469 of 531).The library plays a role in helping respondents obtain the last article, mainly in an electronic form (e.g., online journal collection, electronic library subscription). One respondent comments, "I rarely, if ever, use a print resource for research that is not a required text. Almost 100% of my used research for my college career has come through electronic databases. They are essential to the

success of the modern day researcher." The majority of articles obtained from a colleague or instructor are also electronic (74%, 49 of 66).

We found some differences between how undergraduate students become aware of articles and where the article is obtained (χ^2=354.609, p<.0001). Articles obtained through a library subscription are more often found through searching (56%) rather than browsing (30%), whereas articles obtained through personal subscriptions are more likely to be found through browsing (58%). Articles obtained through a school/department subscription are found by searching (31%), browsing (28%), course outline (16%), instructors (12%), and through citations (8%). Forty-six percent of articles obtained through free web journals are found by searching, 23% by browsing, 12% through an instructor, and just 4% through a citation.

Alternative Source to Obtain Article

Another measure of value is the contingent valuation, which measures value based on whether someone would obtain the information from another source if the original source was not available (Imholz and Arns 2007). This method assumes if the information is important the respondent will try multiple methods to obtain the information, but their initial source is the most convenient, either due to speed or low cost. We asked, "*Thinking back to the source of the article (e.g., library collection, department collection, interlibrary loan, etc.), where would you obtain the information if that source were not available*?" Nearly three-quarters of the readings (73%) would be obtained from another source (380 of 524).

One-third of the articles originally obtained from a library subscription (39 of 120), 30% from a school/department subscription (20 of 66), one quarter from interlibrary loan

(1 of 4), and 26% from a free web journal (31 of 120) would not be obtained from an alternative source. Value would be lost if these original sources were not available because undergraduate students would either not receive the same information or would have to spend additional money or time to use an alternative source.

Format of Article and Location of Reading

Just because 88% of the article readings are obtained from an electronic source does not mean the articles are read on a computer screen. In separate surveys of United States faculty and graduate students (reported separately), we found that 51% of the readings by faculty members (300 of 594) and 55% of the readings by graduate students (529 of 956) are on a computer screen, even though 75% of readings by faculty members and 70% of readings by graduate students were obtained from an electronic source. On the other hand, three-quarters (75%) of the readings by undergraduate students are read on-screen, while the rest are read on print-on-paper, either from a print journal or downloaded and printed out. The computer screen is a preferred method of reading for undergraduate students; however, some students still complained about reading on a computer screen. One respondent comments, "I only use the internet to guide and organize information I need for projects or reports. I much rather use a physical book or library resources. I do not like reading from a computer screen for a long amount of time." Another respondent explains, "I enjoy accessing information from journal articles and books online. It would be very tedious to have to go through paper copies of everything." Only 10% of the readings are from a downloaded and printed article, and 12% of the readings are from a print article in a print journal (Table 14). Just three percent of readings are read on a mobile, e-reader, or

tablet screen. However, one undergraduate says, "I use my iPhone every week in discussion class to reference the required readings for that class." This comment suggests that though a majority of students may not initially articles on a mobile device, they may use that format for later referencing or review of material. For instance, another student says, "My textbooks are on my e-reader. My news articles are on my mobile device and computer/tablet."

Table 14. Final Format of Last Article Reading by US Undergraduate Students

	Frequency	**Percent**
Print article in a print journal	61	11.6
Photocopy or Fax copy	12	2.3
Online computer screen	321	61.0
Previously downloaded/saved and read on computer screen	57	10.8
On a mobile, e-reader or tablet screen	15	2.9
Downloaded and printed on paper	52	9.9
Other	8	1.5
Total	526	100.0

Nearly three-quarters (74%) of the articles obtained from a library/school/department subscription are read on an online computer screen (138 of 187), and only 12% are read from a print journal (22). Eighty-eight percent from a free web journal, 80% from an author's website, two-thirds from course reserves, and 56% from an instructor are read from on an online computer screen.

Purpose of Article Reading

Survey data provides a picture of the purpose, value, and outcomes of article readings. The first question in this series of questions was, "*For what principal purpose did you use, or do you plan to use, the information obtained from the article you last read?*"

Nearly half (48%) of the readings help complete a course assignment or paper (Table 15). Article readings also are required reading for course (21%) or for personal interest (16%). The other principal purposes include unspecified research, preparation for speech, presentations, for work, and for more than one principal purpose. Article readings support nearly all of undergraduate class activities.

Table 15. Principal Purpose of Article Reading by US Undergraduate Students

	Frequency	**Percent**
Required reading for course	116	21.2
Helped complete assignment/paper	261	47.8
For thesis or dissertation	25	4.6
To keep informed	39	7.1
Personal interest	86	15.8
Other	19	3.5
Total	546	100.0

Nearly all (89%) of the required readings are found through the instructor or a reading list (103 of 116). Half (51%) of the readings to help complete a course assignment or paper (133 of 259) and 60% of readings for thesis or dissertation (15 of 25) are found by searching. Just over half (51%) of readings for personal interest are found by browsing and 13% are found by searching. Half of readings for thesis and 34% to help complete an assignment or paper are obtained from a library subscription, but only 6% of required readings are obtained from a library subscription. Twenty-four percent of the readings to keep informed and 5% for personal interest are obtained from the library subscription. Twenty-one percent of the readings to keep informed are also obtained through personal subscriptions. Required readings are more likely to be obtained from a copy from a

colleague or instructor (33%), free web journal (16%), school or department subscription (16%), or course reserves (17%).

Differences of Article Reading Patterns by Demographics

Differences of Article Reading Patterns by Discipline

We found an association between discipline and the number of article readings ($F=1.461$, $p=.201$). Undergraduates in the social sciences read, on average, the most articles per month ($M=18.36$), followed by sciences ($M=16.28$), humanities ($M=16.21$), and undergraduates in engineering/technology/math disciplines ($M=13.14$). Undergraduates in the medical sciences report the fewest article readings per month ($M=10.56$).

There was little variation in the amount of time spent per reading by discipline. Undergraduates in the humanities, on average, spend the most time per reading ($M=30.22$ minutes). Undergraduates in the engineering/technology/math disciplines spend an average of twenty-nine minutes per reading, while students in the medical sciences report twenty-eight minutes per reading, and those in the social sciences report spending twenty-seven minutes reading. Students in the sciences report spending the least amount of time reading ($M=25.99$).

We found a similar association between the United States faculty and graduate student discipline and number of article readings. Faculty members in the medical sciences ($M=37.09$) and sciences report more article readings ($M=26.10$), although medical science faculty spent the least amount of time per reading ($M=28.58$ minutes). Graduate students in the sciences ($M=34.92$) and social sciences ($M=34.92$) read more articles per month, but those in the medical sciences spend the least amount of time per reading ($M=29.46$). Faculty and graduate students in the humanities read fewer articles ($M_{faculty}=21.02$, $M_{graduate}=28.69$) but spend more time per reading ($M_{faculty}=37.92$, $M_{graduate}=45.74$).

There are some differences between year of article publication and academic major ($\chi^2=42.697$, $p=.015$). Forty-five percent of the readings by undergraduates in the social

sciences, humanities (41%), medical sciences (39%), engineering/technology/math (38%), and sciences (33%) are in the first two years of publication. Humanities (30%) and engineering/technology/math students (28%) report more readings over ten years old than students in the sciences (17%), medical sciences (13%), and social sciences (11%). However, humanities students report the least amount of readings in the 2007-2010 range. Only 18% of the readings by humanities students are in the two-to-five year range, compared to 34% by medical science students, 32% by science students, 31% by engineering/technology/math students, and 24% by social science students.

Readings in each discipline are obtained from a variety of sources, primarily split between free web journals, copy from colleague or instructor, and library subscription. Students in the humanities (25%), social sciences (23%), and sciences (22%) are the most likely to obtain article readings from the library's subscriptions. Undergraduates in the medical sciences are the least likely to obtain a reading from the library's subscriptions (15%). Forty-one percent of the readings by students in the engineering/technology/math fields, one-quarter of students in the sciences and medical sciences, 24% in the social sciences, and 18% in the humanities are obtained from a free web journal. Fourteen percent of the readings by students in the sciences and social sciences, 12% in the engineering/technology/math fields, and 10% in the medical sciences and humanities are obtained through an instructor.

The majority of readings in each discipline are read on a computer screen. Seventy-seven percent of readings by undergraduates in the engineering, computer, and mathematics disciplines, 71% by students in the medical sciences, 65% by students in the

humanities, 60% by students in the social sciences, and 59% by students in the sciences are from an online computer screen.

We did not find any significant associations between academic disciplines and how the undergraduate student becomes aware of the article, the principal purpose of reading, or the format of reading.

Differences of Article Reading Patterns by Status, Age, or Gender

There is a significant association between the student's academic year and the number of article readings (F= 3.982, p=.003). Students in the senior year (M=20.53) and junior year (M=15.60) report more article readings per month than students in the sophomore year (M=13.65) and freshman year (M=10.71). Juniors (M=30.27 minutes) and seniors (M=30.15 minutes) also spend more time per article reading (F=3.336, p=.010). Sophomores spend approximately twenty-six minutes (M=25.61) and freshmen spend twenty-one minutes (M=20.98) per reading. There is no significant association between academic year and year of publication, how they became aware of the article, or where they obtained it.

We found some significant differences in academic status and the format of reading (χ^2=46.015, p=.004). As undergraduates progress in their studies, they are more likely to read scholarly articles in print form. One-quarter of the readings by seniors (26%) and juniors (25%) are read in print form (print journal, photocopy, or downloaded and printed), whereas only 19% of the readings by sophomores and 13% by freshmen are in print form. On the other hand, 83% of the readings by freshmen are in electronic format (computer screen, mobile), whereas 80% by sophomores, 75% by juniors, and 72% by

seniors are read in an electronic format. However, more juniors report reading from a mobile device (5%) compared to seniors (3%), freshmen (2%), and sophomores (1%).

We also found some differences in academic status and thoroughness of article reading (χ^2=32.876, p=.008). Sixty-one percent of the readings by sophomores and seniors are read with great care to all or parts of the article, while just 56% by juniors and 54% by freshmen are read with great care. Freshmen more skimming of articles (13%), compared to just 8% of the readings by sophomores, 4% by juniors, and 3% by seniors.

Undergraduates of all academic status report reading most for required readings and to help complete an assignment (χ^2=34.250, p=.024). Over half of the readings by sophomores (53%), juniors (52%), and freshmen (51%) are read to help complete a course assignment, but only 45% of the readings by seniors are read for the same reason. One-quarter of the readings by juniors, 23% by freshmen and sophomores, and 20% by seniors are required readings. Seniors (95) and freshmen (5%) report reading more for a thesis or dissertation. Only 1% of the readings by juniors and no reading by sophomores are for a thesis.

Undergraduates over 30 years old read more scholarly articles than younger undergraduates (F=7.414, p<.0001). Students over 30 read, on average, twenty-two articles per month (M=21.89), followed by students 20-23 years (M=18.74), and students 24-30 years (M=14.21). Older undergraduates also spend more time per article reading (F=7.903, p<.0001). Undergraduates at least twenty four years old spend approximately thirty-eight minutes per reading ($M_{24\text{-}30}$=38.24 and M_{over30}=38.10), followed by students 20-23 years (M=28.75) and students under twenty (M=21.61).

We found some differences in age and how the student becomes aware of the article reading (χ^2=26.669, p=.085). Younger students are more likely to search for articles than older undergraduates (Table 16). Thirty-six percent of the readings by students under 20 (59 of 164) and students 20-23 years (85 of 235) are found through searching. Thirty-four percent of the readings by students 24-30 years (12 of 35) and 31% by those over 30 years (13 of 42) are discovered through searching. One-quarter of the readings by students 20-23 years, 24% of the readings by students under 20 and students over 30 years are found through browsing, but just 14% of the readings by students 24-30 years are discovered through browsing. More readings by students 24-30 years are likely to be found through a course outline/reading list, followed by just 17% by students 20-23 years, 14% by those over 30 years, and just 12% by students under 20 years.

Table 16. Association between Discipline of US Undergraduate Students and How They become Aware of Article Readings

	20 Years and under	21-23 Years	24-30 Years	Over 30 Years	Column Total
Browsing	57 22.9%	41 27.3%	5 14.3%	10 23.8%	113 23.7%
Searching	90 36.1%	54 36.0%	12 34.3%%	13 31.0%	169 35.5%
Cited in another publication	7 2.8%	3 2.0%	2 5.7%	4 9.5%	16 3.4%
An instructor	40 16.1%	18 12.0%	2 5.7%	5 11.9%	65 13.7%
Course outline / reading list	38 15.3%	21 14.0%	8 22.9%	6 14.3%	73 15.3%
Don't know/ don't' remember	3 1.2%	0 0%	0 0%	0 0%	3 0.6%
Others	14 5.6%	13 8.7%	6 17.1%	4 9.5%	37 7.8%
Column Total	249 100.0%	150 100.0%	35 100.0%	42 100.0%	476 100.0%

Younger students are more likely to obtain article readings through a library subscription or free web journal (χ^2=49.077, p=.006). One-quarter of the readings by students 20-23 years, 21% by students under 20 years, 20% by students 24-30 years, and 19% by students over 30 are obtained through a library subscription. Twenty-seven percent of the readings by students under 20 years and one-quarter by students 20-23 years are obtained through a free web journal, while just 11% by students 24-30 years and 5% by students over 30 are obtained through a free web journal.

Younger students are more likely to read in an electronic format (χ^2=31.539, p=.025). Eighty-one percent of the readings by students under twenty and 76% by

students 20-23 years are read in an electronic format. Only 69% of the readings by students 24-30 years and 60% by students over 30 are read in an electronic format. However, older students are more likely to read on a mobile screen, even if they are less likely to read on a screen more generally. Seven percent of the readings by undergraduates over 30 years and 6% by 24-30 years are read from a mobile screen, compared to just 3% by students 20-23 years and 1% by students under 20 years old.

Older students are also more likely to read articles more thoroughly (χ^2=26.427, p=.009). Sixty-nine percent of the article readings by students at least 24 years old are read with great care to all or parts of the article, whereas only 61% of the readings by students 20-23 years, and 54% by students under 20 years are read with care. Moreover, 12% of the readings by students under 20 and 4% by students 20-23 years are skimmed. No under over 23 years old reports skimming an article.

We also found some differences in age and purpose of reading (χ^2=20.978, p=.138). Sixty-six percent of the readings by students 24-30 years, 51% by students under 20 years, 48% by students over 30 years, and 47% by students 20-23 years old are read to help complete an assignment. Younger students report more required readings. One-quarter of the readings by students under 20 years and 22% by students 20-23 are required readings, but only 17% of the readings by students at least 24 years old are required readings.

Male undergraduates read, on average, eighteen articles while female undergraduates read fifteen articles per month (t=1.513, p=.131). Male students also spend more time per reading (t=2.195, p=.029). Male students spend approximately thirty-two minutes per reading while female students spend twenty-six minutes.

We found some differences in gender and how the respondent becomes aware of the article reading (χ^2=11.804, p=.066). Thirty percent of the readings by male students and 21% by female students are discovered through browsing, while 38% of the readings by female students and just 28% by male students are discovered through searching. In addition, slightly more readings by women (14%) than men (13%) are discovered through a course outline or reading list.

Readings by men are slightly more likely to be obtained through a library or school/department subscription, while readings by women are slightly more likely to be obtained through a free web journal or an instructor (χ^2=20.315, p=.016). One-quarter of the readings by men and 22% by women are obtained through a library subscription, while 17% by men and just 10% by women are obtained through a school/department subscription. However, 24% of the readings by women and just 20% by men are obtained through a free web journal. Fourteen percent of the readings by women are also obtained through an instructor while just 11% by men are obtained through an instructor.

We found some differences in gender and how thoroughly an article is read (χ^2=12.171, p=.016). Sixty-six percent of the readings by men and 57% by women are read with great care to all or parts of the article. Eight percent of the readings by women and just 2% by men are skimmed.

There is a significant association between gender and principal purpose of article reading (χ^2=17.452, p=.004). More readings by women are reported as required readings (23%) or to help complete an assignment (53%). Only 20% of the readings by men are required readings and 43% are to help complete an assignment. However, more readings

by men (23%) are reported for personal interest. Just 10% of the readings by women are for personal interest.

Scholarly Book Reading

In other Tenopir & King studies, the *critical incident* of reading focused only on the last scholarly article reading. A 2011 study in the United Kingdom expanded the survey to examine the last book/book chapter and other publication readings of faculty members (Tenopir et al. 2012). In this section of the report we focus on book or book chapter readings by undergraduate students in the United States.

Total Amount of Book Reading

As in the section on scholarly article reading, we started the book reading section by carefully defining book reading and focusing the respondent on the books they recently read or read from. We asked, "*In the past month (30 days) approximately from how many books or parts of books did you read for work? Include reading from a portion of the book such as skimming or reading a chapter. Include classroom text, scholarly, or review books read in print or electronic format*." We are more concerned with the relative amounts of reading than the actual number, and for convenience, we often report readings per year by multiplying the monthly total by 12. Undergraduate students in the United States report an average of six book or book chapter readings per month or approximately 72 per 12-month year (M=5.57, SD=7.033) or 54 per 9-month year. Only 16% of the respondents did not report a book reading in the past month; zero readings were included in our average. Thirty percent of the respondents report over five book readings (Table 17).

Table 17. Number of Book Reading by US Undergraduate Students

Readings per month	Frequency	Percent
0	87	15.6
1 ~ 2	91	16.3
3 ~ 5	216	38.6
6 ~ 10	103	18.4
Over 10	62	11.1
Total	559	100.0

We followed the same variation of *critical incident* technique used in the article section by asking respondents to focus on the last scholarly book reading. We explicitly stated, "*The following questions in this section refer to the BOOK FROM WHICH YOU READ MOST RECENTLY. Note that this last reading may not be typical, but will help us establish the range of reading patterns across a range of academic staff, disciplines, and institutions*." We assume the book readings will be a random sample of readings and will give us detailed information on a wide range of scholarly book readings. We asked the respondents to list the title or topic of the last book or book chapter they read, in order to help them focus on the last reading from a book, book chapter, or part of a book.

Total Time of Book Reading

To get an indication of exchange value, we asked, "*About how much total time (in minutes) did you spend reading this book in the past month (30 days)?*" The average time spent per book reading is three hours (M=176.00, SD=186.495),[7] with a range of less than one minute to sixteen hours. Sixty-three percent of book readings by undergraduates take

[7] Excludes outliers over 960. Including the outliers, the mean is 201.08.

over one hour (Table 18). Nineteen percent of book or book chapter readings are thirty minutes or less. Forty-three percent of the readings take over two hours.

Table 18. Time Spent on Last Book Reading by US Undergraduate Students

Minutes	Frequency	Percent
0-30	88	19.1
31-60	81	17.6
61-90	24	5.2
91-120	70	15.2
121-180	33	7.2
Over 180	164	35.7
Total	460	100.0

Source of Book and Time to Become Aware

After establishing the last book reading and how long they spent per reading, we focused on how they became aware of the book from which they read. We asked, "*How did you or someone on your behalf become aware of this last book from which you read?*" We kept the question and answers similar to the last article reading, and maintained the same definitions of browsing and searching. The majority of book or book chapter readings are found on the course outline or reading list (Table 19). Undergraduate students also become aware of books through an instructor (15%), searching (10%), and browsing (7%). The other sources they used to become aware of books are a friend, a therapist, read in high school, Bible study, advertising, and at a bookstore. We did not ask the respondents to tell us what sources they browse or search.

Table 19. How US Undergraduate Students Initially Become Aware of Books

	Frequency	**Percent**
Found while browsing	30	6.5
Found while searching	45	9.7
Cited in another publication.	10	2.2
An instructor told me about it	69	14.9
Course outline/reading list	280	60.6
Do not know/ do not remember	7	1.5
Other	21	4.5
Total	462	100.0

Obtaining the Book

We asked, "*After you became aware of this book, from where did you obtain it?*" The wording was kept similar to the article section for comparison, but the answer choices were modified to reflect the different sources for books. Over half of the book readings are purchased (Table 20) and may be textbooks required for a class. Twenty percent of the readings are from a library or school/department collection, and 6% are obtained from a colleague, author, or other person. "Other" sources include Blackboard, textbook rental, an instructor, unspecified website or online reading, a download, a family member, and bookstore.

Table 20. How US Undergraduate Students Obtain Books

	Frequency	**Percent**
I bought it for myself	303	65.9 (100.0)
• Print	(282)	(93.1)
• Electronic	(21)	(6.9)
The library or archives collection	67	14.6 (100.0)
• Print	(57)	(85.1)
• Electronic	(10)	(14.9)
Interlibrary loan or document delivery service	9	2.0 (100.0)
• Print	(8)	(88.9)
• Electronic	(1)	(11.1)
School or department collection	26	5.7 (100.0)
• Print	(19)	(73.1)
• Electronic	(7)	(26.9)
A colleague, author or other person provided it to me[8]	27	5.9 (100.0)
• Print	(20)	(76.9)
• Electronic	(6)	(23.1)
A free, advance, or purchased copy from the publisher	6	1.3 (100.0)
• Print	(4)	(66.7)
• Electronic	(2)	(33.3)
Other source	22	4.8 (100.0)
• Print	(14)	(63.6)
• Electronic	(8)	(36.4)
Total	460	100.0

Much has been discussed recently about the future of electronic books. A 2009 CIBER study in the United Kingdom found that 65% of staff and students have read an e-book for work, study, or leisure, and over half of those readings were obtained through the library (51.9%). Similar studies in the U.S. have also shown that e-books are gaining in popularity and are a valuable library resource (Shelburne 2009; Folb et al. 2011). In our study, we found undergraduate and graduate students are reading from more e-books than

[8] Of the 27 respondents who selected "a colleague, author, or other person provided it to me" one respondent did not answer the accompanying question concerning format of reading.

faculty members. Twelve percent of the book readings by graduate students (91 of 757) and 8% of the book readings by faculty (42 of 503) in the United States are obtained from an electronic source, while 12% of book readings by undergraduate students (55 of 460) are from e-books. Eighteen percent of the undergraduate students' book readings obtained from the library/school/department collection are from an electronic copy (17 of 93). One respondent comments, "E-books are great because they don't waste paper and I don't have to carry around giant paper books." However, another student says, "I do feel that when I have time to use print resources my work is of higher quality. The reason is because when I can hold the book in my hands I am more likely to take my time and focus on the task at hand." Some respondents resent ebooks. One student states, "Ebooks are terrible. The worst thing ever; I would rather buy a book I will own in my library or resell," while another laments, "I love books. I enjoy the feel of books, academic or otherwise so I minimize the time I spend reading something on the computer." While electronic resources for books have yet to reach the popularity as journals, e-books are becoming a part of academic culture.

Purpose and Value of Book Reading

The last set of questions focuses on the principal purpose of the last book reading and the value and importance of the reading. We asked, "*For what principal purpose did you use, or do you plan to use, the information obtained from the book you last read*?" While articles are most likely to be read to help complete a course assignment or paper, required reading is the most frequent principal purpose of book reading for undergraduate students (Table 21). Eighteen percent of book or book chapter readings are to help complete a

course assignment or paper and 8% are of personal interest. The other principal purposes are to "keep up with the material in a course," "to supplement a lecture," "as part of the LOM (Life of the Mind) selection committee," group Bible study, background information, and more than one principal purpose.

Table 21. Principal Purpose of Book Reading by US Undergraduate Students

	Frequency	Percent
Required reading for course	315	68.2
Helped complete course assignment/paper	83	18.0
For thesis/dissertation	9	1.9
To keep informed	14	3.0
Personal interest	35	7.6
Other	6	1.3
Total	462	100.0

There is a significant association between the principal purpose and how the respondent becomes aware of the book (χ^2=384.207, p<.0001). Eighty percent of required readings and one-quarter of the readings to help complete an assignment are discovered through a course outline or reading list . Thirty-seven percent of the readings to help complete an assignment, 24% for personal interest, 22% for a thesis, and 21% to keep informed are discovered through searching. Thirty-two percent of the readings for personal interest, 22% for a thesis, 14% to keep informed, and 11% to help complete an assignment are discovered through browsing.

We also found a significant association between the principal purpose of book reading and where it is obtained (χ^2=189.099, p<.0001). Seventy-seven percent of the book readings for personal interest and 76% of required readings are purchased, but only 37% of the readings to help complete a course assignment, 36% to keep informed and just

22% for a thesis are purchased. On the other hand, 52% to help complete a course assignment, 44% for a thesis, and 36% to keep informed are obtained through a library subscription. However, only 9% of personal interest book readings and 4% of required readings are obtained through the library collection. Twenty-two percent of the readings for thesis/dissertations are obtained through interlibrary loan and 11% for school/department subscription are also read for thesis/dissertation. We have combined readings from the library and school/department collections for our analysis because we believe all those readings are actually from the library, but there is an interesting distinction students are making between the principal purpose of reading from those obtained from the library and those obtained from the school/department collection. Nearly all (81%, 21 of 26) the book readings students think are obtained from a school/department collection are required reading, while only 16% of the readings from the library are required reading. Instead, readings obtained from the library are most likely to be read to help complete a course assignment/paper (64%, 43 of 67).

There is discussion in the academic community about the use of e-books for textbooks to save or reduce cost. There seems to be some development in this area in the United States. One respondent reports, "Some professors opt to use articles from online journals in lieu of textbooks and that is always appreciated. Articles tend to be more relevant and up-to-date than textbooks, and are also free and more portable/easily accessed from anywhere." Another respondent says, "The nursing department switched all its books to ebooks thus our reading materials are read on the computer screen, iPad, iPhone, Android, or other type of devices." Over half (60%, 33 of 55) of the e-books are read for required reading and 16% are read to help complete a course assignment or paper

(9). In the United States, e-books are becoming a popular tool for required readings in undergraduate courses. Faculty in the United States read fewer e-books (8%, 42 of 503) than graduate students (12%, 91 of 757) or undergraduate students (12%, 55 of 460).

To measure value in relation to principal purpose we asked, "*How important is the information contained in this book to achieving your principal purpose*?" Seventy-three percent of the book or book chapter readings are considered "important" to "absolutely essential" (Table 22). Only seven percent of the book readings by undergraduate students are considered "not at all important" to the principal purpose. One-quarter of the readings by undergraduate students are considered "absolutely essential," and 24% are considered "very important."

Table 22. Importance of Book Reading to the Principal Purpose of US Undergraduate Students

	Frequency	**Percent**
Absolutely essential	114	24.7
Very Important	111	24.1
Important	110	23.9
Somewhat important	95	20.6
Not at all important	31	6.7
Total	461	100.0

There are some differences between the principal purpose of reading and the importance of reading (χ^2=65.950, p<.0001). Over half of the readings for thesis (56%), to complete an assignment (54%), and required readings (50%) are considered "very important" or "absolutely essential," but only 29% to keep informed and 26% for personal interest are considered the same. On the other hand, just over one-third (34%) of personal interest readings are considered "not at all important." However, only 6% of required readings are considered the same. No readings to help complete a course assignment, for

thesis or dissertation, or to keep informed about the developments in my main field of study are considered "not at all important."

Outcomes of Book Reading

To look at value to principal purpose more closely, we asked, "*In what ways did the reading of the book affect the principal purpose*?" Respondents could select one or more outcomes. The most frequent outcomes of book readings are: improved the result, inspired new thinking, and narrowed/broadened/changed the focus (Table 23). While less than one percent of book readings by faculty members (0.6%, 3 of 509) and just 2% of the readings by graduate students (18 of 774) in the United States are considered a waste of time, 6% of the readings by undergraduate students (28 of 463) are considered a waste of time. Thirteen percent of the readings by undergraduate students made them question their work (62 of 463). The other effects of the book reading included, for enjoyment or fun, to further understand of course material, offered thoughtful citations, and fulfilled assignment (required reading). One respondent notes, however, that "[the reading] introduced me to several of my now-favorite authors/poets."

Table 23. Outcome of Book Reading for US Undergraduate Students*

	Frequency	**Percent**
Improved the result	301	65.0
Inspired new thinking	233	50.3
Narrowed/broadened/changed the focus	144	31.1
Resulted in faster completion	101	21.8
Saved time or resources	92	19.9
It made me question my work	62	13.4
Resolved technical problems	36	7.8
Resulted in collaboration/joint research	35	7.6
Wasted time	28	6.0
Others	24	5.2
Total	463	

*Respondents could select more than one outcome.

Differences of Book Reading Patterns by Demographics

Differences of Reading Patterns by Discipline

There are some significance differences between the respondent's discipline and number of book readings (F=2.156, p=.058) and time spent per book reading (F=.876, p=.497). Table 24 shows the differences between disciplines (Table 24). Undergraduates in the humanities report the most book readings per month (M=7.76), followed by medical science students (M=6.15), social science students (M=5.08), science students (M=4.78), and engineering/technology/math students (M=4.74). "Other" majors read about six books per month (M=6.41).

Table 24. Number of Book Readings and Time Spent Reading for US Undergraduate Students by Discipline

	Number of book readings	**Time spent per book reading (minutes)**
Sciences	4.78	190.21
Medical Sciences	6.15	183.97
Engineering / Technology / Math	4.74	223.88
Social Sciences	5.08	167.36
Humanities	7.76	151.15
Other	6.41	192.25

However, undergraduates in the humanities spend, on average however, the least amount of time per book reading. Book readings by humanities majors, on average, are two hours and a half hours ($M_{minutes}$=151.15). Engineering/technology/math majors spend the most time per reading ($M_{minutes}$ =223.88), followed by science majors ($M_{minutes}$ =190.21), medical science majors ($M_{minutes}$ =183.97), and social science majors ($M_{minutes}$ =167.36). "Other" undergraduates spend approximately just over three hours on book readings per month ($M_{minutes}$ =192.25).

Medical science majors report more electronic book readings than other majors (χ^2=23.667, p<.0001). Just over one-third (34%) of the readings by medical science majors, 15% by "other" majors, 12% by engineering/technology/math majors and social science majors, 8% by humanities majors, and just 4% by science majors are in electronic format.

Nearly all respondents in all disciplines report required readings and course assignments as their primary purposes for book readings (χ^2=23.395, p=.555). Nearly three-quarters (74%) of the book readings by medical science majors, 73% of those by humanities students, 72% of those by social science majors, 65% of those by science majors, 65% of those by "other" majors, and 55% of those by engineering/technology/math majors report reading for required reading (Table 25).

Table 25. Association between Principal Purpose of Book Reading and Discipline of US Undergraduate Students

	Sciences	**Medical Sciences**	**Engineering/ Technology /Math**	**Social Sciences**	**Humanities**	**Others**	**Column Total**
Required Reading	59 64.8%	28 73.7%	18 54.5%	107 71.8%	45 72.6%	43 65.2%	300 68.3%
To help complete a course assignment	18 19.8%	4 10.5%	11 33.3%	25 16.8%	8 12.9%	15 22.7%	81 18.5%
For thesis or dissertation	2 2.2%	0 0%	1 3.0%	2 1.3%	1 1.6%	1 1.5%	7 1.6%
To keep informed/ current awareness	1 1.1%	3 7.9%	2 6.1%	4 2.7%	1 1.6%	2 3.0%	13 3.0%
Personal interest	8 8.8%	2 5.3%	1 3.0%	11 7.4%	6 9.7%	4 6.1%	32 7.3%
Others	3 3.3%	1 2.6%	0 0%	0 0%	1 1.6%	1 1.5%	6 1.4%
Column Total	91 100.0%	38 100.0%	33 100.0%	149 100.0%	62 100.0%	66 100.0%	439 100.0%

We found did not find any other associations between discipline and book reading patterns.

Differences of Reading Patterns by Status, Age, and Gender

Book readings by students in their junior and senior years take, on average, more time than readings by freshman and sophomore students (F=3.742, p=.005). Book readings by juniors are three and a half hours ($M_{minutes}$ =207.51.30), followed by seniors ($M_{minutes}$ =184.07 minutes), sophomores ($M_{minutes}$ =156.46 minutes), and freshmen ($M_{minutes}$ =136.52 minutes). There is no significant association between academic status and number of book readings.

There is a significant difference between academic status and the principal purpose of book reading (χ^2=39.085, p=.007). Most respondents report their principal purpose of book reading to be required reading or to help complete a course assignment. Three-quarters of the readings by sophomores, 70% of those by freshmen, 67% of those by juniors, and 65% of those by seniors report required reading as their principal purpose of reading. Twenty-four percent seniors' book readings, 18% of juniors', 16% by freshmen, and 15% by sophomores are to help complete a course assignment. Freshmen book readings are more likely to report book readings for personal interest (12%). Nine percent of the readings by juniors, and 5% by freshmen and seniors are for personal interest.

We did not find any significant associations between academic status and how the respondent becomes aware of or obtains a book reading or the importance of the book reading to the principal purpose.

Older undergraduates spend more time per book reading (F=4.534, p=.004). Readings by those over thirty years of age, on average, are four and a half hours (M=266.27 minutes), followed by undergraduates 24-30 years of age (M=204.43 minutes), twenty to twenty-three years of age (M=180.76 minutes), and under twenty of age (M=143.49 minutes). We did not find any significant differences between age and number of book readings.

For the most part, younger students report reading more for required reading than older students (χ^2=35.458, p=.002). Just over three-quarters (76%) of students under twenty years of age report required readings, followed by 68% of students over 30 years, 64% of students 24-30 years, and 64% of students 20-23 years of age. One-quarter of the readings by students 24-30 years, and 23% by students 20-23 years report reading to help complete a course assignment, while only 15% over thirty and just 12% of students under twenty report reading for the same reason.

Older students consider their book readings more important to the principal purpose of reading than younger students (χ^2=16.539, p=.168). Two-thirds of the readings by students 24-30 years, 58% by students over 30 years, half of the readings by students 20-23 years, and just 43% by students under 20 years are considered "very important" or "absolutely essential." Nine percent of the readings by students under 20 years, 7% by students 20-23 years, and 3% of students over 30 years are considered "not at all important." No students 24-30 years consider a book reading to be "not at all important."

We did not find any associations between age and how the respondent becomes aware of or obtains the book reading. We also did not find any associations between

gender and number of book readings or time spent reading or how the respondent obtains the book reading.

Sixty-four percent of the book readings by female respondents and 53% of those by male respondents discover book readings through a course outline (χ^2=14.590, p=.024). Male students also discovered readings through an instructor (15%), browsing (13%), searching (11%), and through a citation (3%). Fourteen percent of the readings by female students are also discovered through an instructor, followed by 10% through searching, 4% through browsing, and just 2% through a citation.

We found some differences between gender and where the book reading is obtained (χ^2=12.502, p=.052). Eighteen percent of the readings by men and 14% by women are obtained through the library collection. Seven percent of the readings by women and just 2% by men are obtained through a school/department collection. In addition, 9% of the readings by men and 5% by women are obtained through another person.

We found some differences between gender and principal purpose of book reading (χ^2=8.957, p=.111) (Table 26). Female students are slightly more likely to read for required readings (72%) than male students (61%). Likewise, male students are slightly more like to read to help complete a course assignment (20%) than female students (18%).

Table 26. Association between Principal Purpose of Book Reading and Gender of US Undergraduates

	Male	Female	Column Total
Required Reading	83 60.6%	219 71.8%	302 68.3%
To help complete a course assignment	28 20.4%	54 17.7%	82 18.6%
For thesis or dissertation	2 1.5%	5 1.6%	7 1.6%
To keep informed/ current awareness	6 4.4%	7 2.3%	13 2.9%
Personal interest	16 11.7%	16 5.2%	32 7.2%
Others	2 1.5%	4 1.3%	6 1.4%
Column Total	137 100.0%	305 100.0%	442 100.0%

Over half of male students (59%) consider their book readings to be "very important" or "absolutely essential" while 45% of female students consider the same (χ^2=8.711, p=.069). Only 7% of female students and 4% of male students consider their readings "not at all important."

Social Media Participation and Creation

The use of social media has increased in the last few years in both the academic and non-academic world. In this study, we wanted to see if use of social media for academic purposes has an influence on reading of traditional scholarly materials. According to the JISC website, social media or Web 2.0 technologies are, "innovative online tools designed to enhance communication and collaboration." Social media includes blogs, twitter, online videos, social networks, and other online and electronic tools.

A 2010 study by the Research Information Network (RIN) found that social media tools (blogs, wikis, file-sharing services) are being used as supplements to the traditional forms of information (monographs, journal articles, etc.). Academics place value on the traditional publications because they receive recognition and rewards for their work. In the RIN study, only 13% of the respondents used social media tools frequently, and 39% did not use them at all. The study found that academics are supportive of social media because it allows them to freely share ideas and collaborate with a broader scholarly community. While they found a few slight associations between social media use and demographics, for the most part age, discipline, and position are not key factors. They concluded that while social media will continue as a supplement to traditional publications, academics' lack of trust and quality will keep it from creating a radical change in scholarly communications (RIN 2010). Our findings support the 2010 RIN findings.

Participation and Creation of Social Media

Social networking (e.g., Facebook), video sharing (e.g., YouTube), and collaborative authoring (e.g., Google docs) are the most frequently used social media by undergraduate students (Table 27). Nearly half of undergraduates in the United States report they

participate in a social network daily (49%), 14% participate in collaborative authoring and 16% participate in video sharing on a daily basis. One student explains, "Youtube lectures can be exceptionally helpful and interesting," and another says, "I find and share interesting or current journal articles on Flipboard and Facebook daily." Social tagging (e.g., Delicious) and RSS feeds are used the least. Overall, undergraduate students in the United States participate more frequently in social media than graduate students and faculty. Only 8% of undergraduates do not participate in any of the social media tools we listed at least occasionally.

Table 27. Participation in Social Media by US Undergraduate Students

	Daily	Weekly	Monthly	Occasionally	Never	Total
Blogging	42 8.1%	61 11.7%	22 4.2%	95 18.2%	301 57.8%	521 100.0%
Microblogging	119 23.1%	26 5.0%	13 2.5%	58 11.2%	300 58.1%	516 100.0%
RSS Feeds	13 2.6%	21 4.3%	16 3.2%	58 11.7%	386 78.1%	494 100.0%
Social Networking	255 48.9%	50 9.6%	26 5.0%	71 13.6%	119 22.8%	521 100.0%
Social Tagging	24 4.7%	19 3.7%	12 2.3%	34 6.7%	422 82.6%	511 100.0%
Collaborative Authoring	71 13.7%	76 14.6%	76 14.6%	115 22.1%	182 35.0%	520 100.0%
Comments in articles	30 5.8%	61 11.8%	43 8.3%	121 23.4%	261 50.6%	516 100.0%
Image sharing	34 6.6%	55 10.6%	38 7.3%	88 17.0%	303 58.5%	518 100.0%
Audio sharing	14 2.7%	50 9.7%	35 6.8%	75 14.6%	340 66.1%	514 100.0%
Video sharing	80 15.5%	120 23.2%	59 11.4%	116 22.4%	142 27.5%	517 100.0%

Undergraduate students participate in social media more than they create it. Nearly a third (31%) of undergraduates do not create any of the social media tools listed at least

occasionally. When students create social media, it is occasional rather than regular. Social networking and collaborative authoring are the most frequently created (Table 28). A respondent explains the value of creating video-sharing content to his/her academic work, "YouTube makes video projects easy – no DVD is strictly necessary. I've filmed on an iPod once and uploaded straight to YouTube." However, another student contends, "Last semester I had a course that relied heavily on e-resources including an ebook text, required blogging, required microblogging, and simulation software. Though each of the resources were at least minimally adequate, I felt the unconventionality of the course made it unnecessarily difficult to learn." Thirteen percent of undergraduates create content on social networking sites on a daily basis. Less than 10% create content on RSS feeds and social tagging.

Table 28. Creation of Social Media by US Undergraduate Students

	Daily	Weekly	Monthly	Occasionally	Never	Total
Blogging	16 3.1%	24 4.7%	10 1.9%	61 11.8%	404 78.4%	515 100.0%
Microblogging	45 8.8%	25 4.9%	11 2.1%	49 9.5%	384 74.7%	514 100.0%
RSS Feeds	1 0.2%	4 0.8%	7 1.4%	21 4.2%	417 93.5%	504 100.0%
Social Networking	66 12.9%	55 10.7%	36 7.0%	80 15.6%	275 53.7%	512 100.0%
Social Tagging	8 1.6%	9 1.8%	9 1.8%	18 3.5%	468 91.4%	512 100.0%
Collaborative Authoring	20 3.9%	37 7.2%	45 8.8%	90 17.5%	322 62.5%	514 100.0%
Comments in articles	6 1.2%	21 4.1%	22 4.3%	80 15.6%	384 74.9%	513 100.0%
Image sharing	9 1.8%	13 2.5%	14 2.7%	46 9.0%	431 84.0%	513 100.0%
Audio sharing	3 0.6%	8 1.6%	13 2.5%	39 7.6%	448 87.7%	511 100.0%
Video sharing	7 1.4%	16 3.1%	15 2.9%	95 18.5%	380 74.1%	513 100.0%

Participation in Social Media and Demographics

For our analysis we defined participation as using social media daily to occasionally (less than monthly). Table 29 shows the number and percentage of undergraduates in each discipline who participate daily to occasionally in each social media tool. Social networking is the most popular tool in each discipline, while RSS feeds and social tagging are the least frequently used. Overall, undergraduates in the engineering/technology/math fields tend to participate in less social media than the other disciplines, while social science and humanities majors tend to participate more.

Table 29. Participation in Social Media of US Undergraduate Students by Discipline

	Sciences	**Medical Sciences**	**Engineering/ Technology/ Math**	**Social Sciences**	**Humanities**
Blogging	36 32.4%	19 40.4%	15 34.9%	69 41.6%	36 53.7%
Microblogging	33 29.7%	20 44.4%	12 28.6%	85 51.2%	27 40.9%
RSS Feeds	18 17.0%	9 21.4%	8 18.6%	40 24.8%	15 24.2%
Social Networking	83 74.1%	43 89.6%	32 74.4%	129 77.7%	50 76.9%
Social Tagging	14 13.1%	10 21.3%	5 11.9%	35 21.2%	10 15.6%
Collaborative Authoring	66 60.0%	35 72.9%	21 48.8%	120 72.3%	36 54.5%
Comments in articles	44 39.6%	26 55.3%	15 34.9%	87 52.7%	34 51.5%
Image sharing	36 32.4%	23 48.9%	15 34.9%	73 44.0%	28 43.1%
Audio sharing	29 26.6%	16 34.0%	11 25.6%	59 35.8%	24 37.5%
Video sharing	85 76.6%	33 70.2%	25 58.1%	125 75.3%	44 67.7%

Students who used more social media tools read more articles (F=2.049, p=.106). Undergraduates using one to two social media tools read an average of fifteen articles (M=15.43), followed by those who used between three and five tools (M=14.54), and more than five tools (M=17.42). By contrast, undergraduates who did not use any of the social media tools listed read, on average, eight articles (M=8.55). Similarly, undergraduates who used social media tools read more scholarly books as well (F=3.574, p=.014). Undergraduates who used more than five tools read, on average, seven books (M=6.77), followed by students using between three and five tools (M=5.36), and students using only one or two tools (M=4.82). Undergraduates who did not use any social media tools listed read only three articles on average (M=3.28).

We found some differences in academic status and participation in blogging (χ^2=10.492, p=.033), microblogging (χ^2=13.240, p=.010), RSS feeds (χ^2=6.974, p=.137), social networking (χ^2=10.706, p=.030), social tagging (χ^2=6.584, p=.160), and audio sharing (χ^2=11.930, p=.018) (Table 30). Seniors are more likely to view/read blogs (51%) and juniors (36%), sophomores (36%), or freshmen (40%). However, freshmen (49%) and sophomores (48%) are more likely view/read microblogs than seniors (43%) or juniors (29%).

Table 30. Association between Academic Status of US Undergraduates and Participation in Social Media

	Freshman	Sophomore	Junior	Senior
Blogging	47 39.5%	36 36.4%	44 35.8%	82 51.3%
Microblogging	59 49.2%	47 48.0%	35 29.4%	69 43.1%
RSS Feeds	21 19.1%	17 17.5%	21 18.6%	45 29.0%
Social Networking	99 81.8%	81 82.7%	81 66.9%	127 78.9%
Social Tagging	29 24.4%	18 18.4%	19 16.0%	22 14.1%
Audio Sharing	28 23.3%	32 32.3%	41 34.2%	64 40.8%

In general, older undergraduates tend to participate in more types of social media tools (Table 31). We found differences between age groups and the participation in blogging (χ^2=6.483, p=.090), microblogging (χ^2=5.972, p=.113), RSS feeds (χ^2=12.934, p=.005), social networking (χ^2=5.843, p=.120), collaborative authoring (χ^2=6.095, p=.107), image sharing (χ^2=6.497, p=.090), and audio sharing (χ^2=20.982, p<.0001). Students over thirty participate the most in blogging (57%), image sharing (60%), and audio sharing (55%), and students under twenty are the least likely to participate in RSS feeds (17%) and audio sharing (24%). However, students under twenty are the most likely to view/read microblogs (49%), and those 24-30 (44%) view/read RSS feeds more than other age groups.

Table 31. Association between Age of US Undergraduates and Participation in Social Media

	Under 20 Years	20-23 Years	24-30 Years	Over 30 Years
Blogging	67 37.0%	105 42.0%	18 48.6%	25 56.8%
Microblogging	89 48.9%	92 37.4%	14 37.8%	18 42.9%
RSS Feeds	29 16.8%	51 21.3%	15 44.1%	10 25.6%
Social Networking	151 82.1%	182 73.4%	31 83.8%	35 81.4%
Collaborative Authoring	114 62.0%	172 69.1%	25 67.6%	21 51.2%
Image Sharing	75 41.2%	97 39.0%	14 37.8%	25 59.5%
Audio Sharing	44 24.2%	86 35.0%	19 51.4%	23 54.8%

Female students participate more often in social networking (χ^2=12.719, p<.0001), collaborative authoring (χ^2=7.059, p=.008), and image sharing (χ^2=2.370, p=.124). A vast majority (82%) of female students participate in social networking, but only 68% of male students participate. Over two-thirds (69%) of females participate in collaborative authoring and 43% participate in image sharing. By comparison, 36% of male students participate in image sharing and just 57% participate in collaborative authoring at least occasionally. However, more male undergraduates participate in RSS feeds (χ^2=2.063, p=.151). Twenty-six percent of male students and just 20% of female students participate in RSS feeds.

Creation of Social Media and Demographics

For our analysis, we defined creation as using social media daily to weekly, monthly, or occasionally. We did not find any significant associations between academic discipline

and the creation of social media tools. Overall, social science and humanities majors create the most social media content. Table 32 shows the number and percentage of undergraduates in each discipline who create content for each social media tool on a daily to occasional basis.

Table 32. Percentage of US Undergraduate Students Who Create Social Media by Discipline

	Sciences	Medical Sciences	Engineering /Technology /Math	Social Sciences	Humanities
Blogging	17 15.3%	8 16.7%	8 18.6%	39 23.4%	18 27.7%
Microblogging	20 18.0%	14 29.2%	5 11.9%	62 37.1%	16 24.6%
RSS Feeds	4 3.7%	3 6.4%	3 7.5%	17 10.4%	2 3.1%
Social Networking	45 40.5%	28 58.3%	17 39.5%	81 49.1%	33 50.8%
Social Tagging	6 5.5%	6 12.5%	4 9.3%	17 10.2%	3 4.8%
Collaborative Authoring	37 33.3%	17 35.4%	18 41.9%	61 36.3%	24 37.5%
Comments in articles	24 21.8%	15 31.3%	6 14.0%	41 24.6%	21 32.3%
Image sharing	13 11.8%	10 20.8%	7 16.3%	30 18.0%	8 12.5%
Audio sharing	11 10.1%	6 12.5%	3 7.1%	26 15.6%	6 9.4%
Video sharing	25 22.5%	12 25.0%	10 23.3%	53 31.9%	18 28.1%

As with the participation in social media, we found that undergraduates who create social media content read more articles ($F=1.232$, $p=.298$) and books ($F=2.263$, $p=.080$). Undergraduates who create content for at least six social media tools read the most articles and books per month on average ($M_{articles}=18.46$, $M_{books}=7.33$), followed by those who create content for one or two tools ($M_{articles}=16.80$, $M_{books}=6.10$), and students creating

content for between three and five social media tools ($M_{articles}$ =14.66, M_{books}=5.37). Undergraduates who create no social media content read only thirteen articles (M=13.23) and five books (M=4.67) per month.

We found some differences in academic status and the creation of content for blogging (χ^2=9.954, p=.041) and RSS feeds (χ^2=10.533, p=.032). Seniors (29%) are more likely to create content for blogs than freshmen (18%), sophomores (23%), or juniors (15%). Seniors are also more likely to create RSS feeds (12%). Only 6% of freshmen, 4% of sophomores and 3% of juniors create RSS feed content.

Seniors create more content for collaborative authoring tools (χ^2=10.475, p=.033) and user comments (χ^2=6.876, p=.143). Forty-six percent of seniors create collaborative authoring content, followed by 34% of juniors, 32% of sophomores and 32% of freshmen. Nearly one-third (32%) of seniors create user comments too, compared to 25% of freshmen, 23% of sophomores and 18% of juniors.

Older students create more content for RSS feeds (χ^2=15.204, p=.002), collaborative authoring (χ^2=6.326, p=.097), user comments in articles (χ^2=4.718, p=.194), and audio sharing tools (χ^2=5.626, p=.131). Table 33 shows the differences between the creation of content for these tool and age group of respondents. United States undergraduates over thirty years of age create more social media content. Twenty percent of students over thirty create RSS feed content, 42% for collaborative authoring, 38% create user comments, and 22% create audio sharing content.

Table 33. Association between Age of US Undergraduates and Creation of Social Media Content

	RSS Feeds	Collaborative Authoring	User Comments	Audio Sharing
Under 20 years	6 3.3%	56 30.6%	42 23.0%	17 9.3%
20-23 years	16 6.6%	101 40.6%	62 25.0%	33 13.3%
24-30 years	2 5.6%	17 47.2%	7 20.0%	3 8.8%
Over 30 years	8 20.0%	17 40.5%	16 38.1%	9 22.0%

Twenty-three percent of female students and just 18% of male students create blogging content (χ^2=1.663, p=.197). Forty-eight percent of female students and 42% of male students create social networking content (χ^2=1.889, p=.169).

We found no other differences between status, age, or gender and the creation of social media content.

Open Ended Questions

At the end of the survey, we asked, "*What role do e-resources play in your school work?*" We hoped the open-ended questions would provide the forum for the respondents to address any issues or topics that were not addressed in the survey. In addition, the open-ended comments provide another dimension to understand the value of scholarly reading and library resources. We received 427 responses.

The majority of the comments praised the role of scholarly articles in their coursework activities, and especially noted the important of the library's electronic collections. Many comments cite the importance of electronic articles and material because professors post articles and information online. Many undergraduates consider e-resources the first port of call. They note articles are absolutely essential because they keep them up-to-date and electronic access is convenient and a time-saver. The following are the responses we received in response to the question, "*What role do e-resources play in your school work?*":

The comments can be categorized into five groups: importance of scholarly articles, the role of the library, use of electronic resources, value and use of books, use of social media, and use of mobile screens. Nearly all of the comments stressed the importance of electronic resources to their undergraduate work.

Importance of scholarly articles

- *I use e-resources primarily. My department puts pretty much everything online and all my resources are online. I do not use journals that require an account. If you can't find the information on Google it basically does not exist since referring to information in paper that is in a journal account is too easy to falsify. I can claim almost anything I want is in a journal article and if you don't have the account also you have no way to verify. I would use a paper resource only if absolutely required by a professor since I consider it a waste of my time and the readers' time.*
- *Helps me locate important articles, and find images*

- *Very important, I use the internet almost everyday because my professors post articles online and our homework is majorly on the internet and using web resources.*
- *Invaluable role. Online journal databases through the library are a huge help and prospector website has been essential to my learning.*
- *A very extensive role. Without e-resources, my classes would function very differently and it would be much more difficult access the numerous articles required, as well as sharing information, etc.*
- *I use JSTOR and other scholarly journals for research. They are easy to access and priceless when it comes to researching large topics.*
- *A very large role. I wish I had access to more journals, it would be very helpful.*
- *A huge role, I need access to biological journals, and I wouldn't be able to access them without my university library's database access.*
- *A pretty significant role. All of my classes have required us to write or speak about a scholarly article. I use the database to find these and then read them on my computer which is very convenient.*
- *If I am looking for information or an article I will go to the e-resources first.*
- *Daily usage via Blackboard is required, but not essential. E-resources are useful to find articles, reading, etc.*
- *They provide the articles that we are assigned to read. They also provide studying assistance.*
- *They allow me to efficiently peruse and cite articles for various written projects (academic and recreational) I complete from time to time*
- *Access to electronic papers and journals are vital to reading and researching new developments and ideas for me. I like them a lot.*
- *A significant role: from research for course projects to cultivating curiosity; most of my sources are online journal articles whether it be a project on Absorption spectroscopy or the education system in Djibouti, I use the online access to journal articles about 5-6 times per week. This availability encourages further research and development of curiosity.*
- *Some professors opt to use articles from online journals in lieu of textbooks and that is always appreciated. Articles tend to be more relevant and up-to-date than textbooks, and are also free and more portable/easily accessed from anywhere. I like incorporating articles into learning and class discussion way more than textbooks.*
- *They are where I get my journal articles from*
- *Very large part because of research into journals and political documents related to subject matter being discussed within the classroom.*
- *Most teachers assign electronic articles to read and I use databases to write papers.*
- *I use a lot of e-resources for my classes and sometimes to read interesting articles on topics I like.*

- *A huge role. They really help me to complete papers and current event articles for many classes.*
- *Articles for class*
- *I frequently attempt to read scholarly articles through the university subscriptions, but it is only occasionally required for a class.*
- *I use a ton of e-resources for articles. It makes getting my work done so much easier.*
- *I frequently am required to read articles online for at least 2 of my classes.*

Role of the library

- *It makes researching topics so much easier. I haven't entered the Library one time and I graduate this semester with my MA.*
- *Very useful. It is more easily accessible at home or away from campus. I don't have to worry about library fees if a book is late. When e-resources are used well for an educational purpose in a class, it is usually very effective.*
- *E-resources offer convenience and ease of access to materials. I utilized my library's digital archives while abroad. It is very helpful for research on the occasional paper I do have to write.*
- *A huge role! My time is limited so any research I can do outside the library is excellent! The majority of my research is done online.*
- *I need the electronic resources/subscriptions that the university and the library purchase to complete assignments. They provide technical information that supports the work that I do for class.*
- *They play a huge role. They enable me to find primary and secondary sources that I can't find in our library.*
- *E-resources make it possible for me to complete my schoolwork. I would not be able to obtain relevant research without the e-resources available through my university's library subscriptions.*
- *They are immeasurably important to my classes and learning! I use [the university] library databases at least three times a week.*
- *I use them fairly often for school related projects. I find them to be very helpful and efficient. They are easier to access than going into the library to find a book on the topic.*
- *I use online journal subscriptions from the library often and occasionally teachers require me to utilize social media for class.*
- *I utilize them often as a means to understand and back up course material so that I can achieve a better knowledge of studied subjects. They library is very helpful in*

obtaining these and providing sources. My favorite search engine for articles is Ebscohost and academic search premier.

- *E-resources are important because they are extremely easy to access through library databases. Without the databases, I would have to spend much more time vetting legitimate sources for academic information.*
- *E-sources are essential to my education. Without the internet and the library at my disposal I would be unable to complete my work.*
- *It makes it much easier to find information since I do not live near campus and do not have easy access to the library*
- *I use a lot of articles from the library database to complete papers.*
- *E-resources played a big role in my education, because they are easy to access and easy to find. I go to the library for my research probably about twice a semester (though I wish that was not true).*
- *They are awesome! I love being able to connect to the VPN from my house and look at articles for class to write my papers. I love the abundance of articles on the library's website. Keep it up!*
- *They provide access to materials not physically available in libraries or collections at [my university].*
- *It helps to maximum my access to the library and other sources of information.*
- *They play a large role because I do not go to the library often to find sources. However, if there weren't e-resources, I would go to the library.*
- *It is easier to find articles online rather than in a library.*
- *They play a large role. Many of my classes are research based and require journal articles that I couldn't find without the library resources.*
- *Online databases are extremely helpful once I was taught how to properly use them.*
- *Only in preliminary research. I only use the internet to guide and organize the information I need for projects and reports. I much rather use a physical book or library resources. I do not like reading from a computer screen for a long amount of time.*

Use of electronic resources

- *I loathe them but many of my professors seem to think that they are wonderful.*
- *So, far not much. My required materials are in printed versions.*
- *Not quite sure what an e-resource is.*
- *important*
- *very important*
- *major role*

- *They are just used for UNHO and entertainment.*
- *To develop my thesis and critical thinking.*
- *They are helpful as supplemental material to class lectures*
- *searching databases for articles for lab reports and finding educational videos to fill in the gaps of lectures*
- *They play a major role.*
- *A large role. I use them in almost every class for papers or presentations.*
- *They are the usual way that I get information for all my papers.*
- *Gathering information*
- *Without the internet, I believe I would fail all my courses because I would not have the patience to find what I am looking for in a non-electronic source.*
- *I use databases in all of my homework papers*
- *It's one of the only ways I get information outside of class*
- *Help with papers and assignments*
- *They play somewhat of an important role in that the university's blackboard is an e-resource and I frequently use the internet to look up information for courses.*
- *I use them occasionally, but I do not feel they play that big of a role.*
- *Very important*
- *They are how my teachers give us access to assigned online readings*
- *Class homework, help forums and information is all online. I do most of my research electronically.*
- *Makes researching for papers much easier and simpler*
- *So far, they're the basis of "homework" assignments and my required readings in some courses.*
- *They provide me with sources for my research papers.*
- *They are my main form of information.*
- *I do not use them*
- *85% of learning outside of the classroom comes from e-resources.*
- *None*
- *They are absolutely essential.*
- *Help me get some work done*
- *A large one.*
- *they aid in the completion of essays and other school work*
- *A significant one. They help in all of my classes.*
- *a great deal*
- *When I am writing a speech or doing an actual paper it is useful*
- *I think they play a very important role because that is how most students obtain most of their information, including me. Information seems to be much more accessible*

through the internet than through the library or other print sources. We also often have to have a great number of sources, which is more easily accomplished through internet searches.

- *Research*
- *they assist greatly in the completion of papers and other assignments*
- *very important for quick and effective research*
- *I USE THEM EVERYDAY FOR MORE THAN 1 HOUR.*
- *I use e-resources to research for school papers.*
- *Main source of problem examples.*
- *E-resources play a large role for quick research, however I prefer print resources because it is easier to view drawings and technical information.*
- *Most of it. Google Translate all the way baby!*
- *Research*
- *a good one*
- *I get a lot of information from the internet*
- *I use blackboard for most of my classes and online research*
- *Daily*
- *Research*
- *they are very important*
- *They are completely essential.*
- *Data collection is easier when it is in 1 source, like on Academic Search Premier.*
- *a big role they help me to find articles for my papers*
- *They allow quick access to information, thereby increasing the amount of knowledge obtained in a decreased amount of time.*
- *A considerable role; many of my reading assignments are completed via Blackboard. Moreover, I complete many research assignments and papers using references obtained online through sites like JSTOR or Wiley Online Library.*
- *They play a huge role in my education*
- *MAJOR*
- *I use them for course requirements and for my research assistantship.*
- *Not a very big role*
- *They are very helpful and convenient and would prefer to use them*
- *They are very important and help with writing essays.*
- *They help with my thesis*
- *daily*
- *They are essential to my research.*
- *They are my education!*
- *a significant one*

- *I use e-resources to find and evaluate information. I can compare opinions and information using different websites or articles.*
- *A large role. They are the majority of my resources.*
- *Critical Role*
- *I am not sure exactly what e-resources are; I might have come across a few during my research for a speech.*
- *Almost all of it to gather a general idea, and then use non-internet resources for specifics.*
- *they are easy to obtain and provide sources for my writings*
- *they help me find and utilize info. relative to my school work, as well as complete and review assignments.*
- *They make it easier to research, when it is necessary to do so.*
- *A large one. They are able to help me complete work faster.*
- *Large role*
- *They help with research!*
- *They are important for allowing me to obtain information about all sorts of things, from general information about a topic (such as on Wikipedia or a course homepage) to very specific information (such as in a journal article). I do not like e-textbooks or e-books, but the fact that academic journals are available online makes it very easy to search for relevant topics and articles in my field.*
- *A very large role.*
- *I would not be able to complete my coursework without it.*
- *large*
- *Help in writing core papers*
- *I am unsure what is meant by "e-resources." I rely extensively on online journals to obtain information related to my research, and I utilize search engines on a daily basis to access particular bits of information quickly.*
- *An important role, it's nice to have things readily available. Most of the research I've done for class and as student staff have been made Possible because of access to e-resources*
- *Very important for research.*
- *They are extremely important to me. In this day and age, you cannot complete course work without online resources.*
- *They are the foundation of all my research for any project I do both in and out of school.*
- *I use them for papers*
- *None*
- *It would be impossible to do my work without it.*
- *I often use e-textbooks and websites to supplement course-related material.*

- *I enjoy accessing information from journal articles and books online. It would be very tedious to have to go through paper copies of everything.*
- *Little to none.*
- *I've used online databases extensively, particularly in my search for sources for my thesis project.*
- *Help me find sources i need*
- *A pretty big part.*
- *help learning*
- *I have been using them more.*
- *My teachers use Blackboard a lot, to post assignments and readings. I also have to post my articles, videos, etc. for journalism classes online sometimes.*
- *They help disseminate knowledge that would have otherwise have been unavailable. E-resources have played an integral part in my ability to bridge the gap between the theoretical concepts learned within the classroom to the practical realities.*
- *Researching precedents is critical and e resources are necessary*
- *very important help me complete work*
- *accomplish assignments and tasks*
- *supplemental education*
- *Homework, research, satisfies my curiosity, communicating with colleagues/peers/instructors, etc.*
- *I sometimes use them*
- *use it for almost every assignment*
- *They play a huge role! I use them all the time.*
- *They enrich my education tremendously. The ones I actually use must be accessible in 5 minutes or less from my computer or, chances are, I will look elsewhere.*
- *Serve as a great resource for research papers*
- *I prefer obtaining information online initially although I often times prefer to read it in print once it has been located.*
- *Instead of buying textbooks or compilations of articles, I usually find them online. It's cheaper, faster, and more convenient, but not always strictly legal. Additionally, many of my professors provide their students with scanned versions of articles, or provide them electronically instead of making them buy a book.*
- *IMPORTANT*
- *None*
- *They are integral. E-resources allow us to access a lot of information quickly and efficiently so that our assignment can be better informed and more scholarly.*
- *E-resources are my primary source of information when writing papers or completing major presentations or assignments.*
- *Convenient*

- *E-resources allow me to broaden my horizons (with respect to my major)*
- *I use e-resources everyday for 95% of my assignments. However, if these sources did not exist I would find another source.*
- *Very big, it is how I manage to do most of my research*
- *Help speed research for class and for my own benefits. This speed allows me to learn even faster and can help me wander into knew and unlearned fields.*
- *They assist me by providing valuable information for term papers I write*
- *High importance for research and everyday class*
- *E-resources play a significant if not critical role in my education. It is from this i am able to locate sources of research both electronic and print. As well as broaden my focus and knowledge on a subject.*
- *None*
- *They are the source of most readings assigned to me for classes*
- *Reinforced the material learned in class.*
- *They play a major role in my studying and gaining information I want to know.*
- *They enable me to conduct research for certain topics, create presentations and write papers.*
- *To provide information about unfamiliar topics, and social connection with teachers and students.*
- *Vital!*
- *A very crucial role, without internet access to resources my college career would have been much more difficult to complete.*
- *They play a major role when righting papers or doing presentations*
- *I use e-resources for class assignments and for research for my undergraduate honors thesis. My life would be much more difficult without these tools.*
- *HUGE. I firmly believe there is a lot of learning which takes place outside of the classroom. It is interesting and fun to connect the information obtained from these additional external resources to the material you learn about inside the classroom.*
- *Essential to supplement evidence of knowledge or details not specified in text or by the instructor.*
- *They account for >90% of my education.*
- *A small role*
- *Essential.*
- *A very large role. Passing my courses would be impossible without them.*
- *They help me when I have to do research or write a report.*
- *They are huge, both for research, general information and networking / information sharing.*
- *Online resources including online databases, search engines, and documents are incredibly useful and aid in my education for almost every course I take.*

- *I read them for class or the lab I work in.*
- *all of my text books are e books*
- *I use the journal articles a lot for my lab classes. They are really helpful for research papers and lab papers.*
- *A large one*
- *They are very useful for keeping large amounts of information readily available from a single physical location, such as my personal computer. It is also useful when I can access this same information from any number of locations, such as computers all over campus.*
- *Researching topics for various classes*
- *They play a huge role in allowing me to complete assignments properly.*
- *a very important one*
- *A somewhat sizeable role in my research.*
- *It makes my life easier!*
- *they are helpful for research*
- *essential to projects and side interest research*
- *I use them most every day and they are often used for my personal study uses or because an instructor recommended or assigned them.*
- *A strong role. They are easy and convenient to access and to take notes from.*
- *A very big role.*
- *They become more and more important as I've gotten older and e-resources have become more available.*
- *a big role*
- *A lot it is essential to research*
- *Essential. Without them, I would not be able to complete the assignments in as much time as I have been.*
- *Critical - Daily use.*
- *a huge role. Whenever I do not know a word or technique i look it up online.*
- *E-resources are extremely important to my education. Unfortunately, too much information is migrating online (in my opinion) making it more difficult to read. Most recently I was looking for 2011 New York Times articles, which were only to be found online. I searched at [my university] library as well as my local library. Skimming and reading online does not invite as much thoroughness.*
- *E-resources are useful but reading books and journals is much better. I feel it tends to be more trust worthy and content specific.*
- *I use them on almost a daily bases to assist me in homework, research, self-knowledge, etc.*
- *I use the internet everyday for class and otherwise. Thus, a very significant role/*

- *A vital role it is a quick way to read articles online and gather important information online however I do prefer hard books over e-resources.*
- *It has helped a lot.*
- *Crucially fundamental role in gathering and distributing/sharing information and communications.*
- *They're absolutely essential. The shape of my education would be completely different (and sadly impoverished) without access to electronic resources.*
- *Lots, though only when I need "solid" facts*
- *vital*
- *A very large role. My major asks me to complete copious research papers and e-resources make researching articles much easier.*
- *They are required, most materials are online. i don't like it.*
- *A large role. We have a system where all documents for every class are stored. Also, my physics class uses smartphysics as a prelecture site.*
- *They provide an easier way to obtain search materials for projects, papers, and general information on the topic in hand. These resources are useful in my science classes for understanding mechanisms and concepts more concretely (e.g. Wikipedia, nmr databases, Google searches for mechanisms, etc.). In humanities and literature courses, e-resources are mainly used for research materials for essays, purchasing books online, or reading scholarly articles for class.*
- *I use them mainly for school assignments or for studying.*
- *They're very important. My PLC class utilizes e-resources almost exclusively, with TEDtalk, YouTube, and electronic articles given weekly as reading.*
- *They play a pretty significant role when I have to do papers and cite certain authors to give credit where credit is due.*
- *I use e-resources to clarify topics taught in class. It is of great benefit to me to find lecture notes from instructors at other universities/colleges; it gives me several different perspectives.*
- *I use them for almost every project or paper I do.*
- *A huge roll. They are practically all I use.*
- *they let me have access to different opinions around the globe and all kinds of information that would benefit me*
- *Without e-resources I would have no resources.*
- *I use them for writing papers and completing projects.*
- *Research*
- *E-Resources are some of the most important resources for my education - both in school and out. I learn most of what I know from electronic/online data.*
- *Very important!!*
- *A little*

- *Easy access to countless journal articles that would otherwise be more difficult and more time-consuming to obtain. Online postings of assignments, course outlines, and projects allows me to reference these documents from my computer or my phone at any time, without the need to carry around a wearing-out printed copy. E-resources are essential, very important.*
- *A significant role!*
- *I don't know what this is.*
- *they're important*
- *E-resources are a huge part of my education. Without them, I wouldn't have the convenience of finding help with my hard course work in my home.*
- *A large one*
- *It's very important and convenient.*
- *A big role in research projects and papers*
- *They often play a larger role then the print information. I prefer online resources to print for convenience.*
- *Very important supplement/source*
- *I use them whenever possible to obtain a better understanding of materials.*
- *Improve research*
- *They allow me to make strong arguments and support my ideas in paper.*
- *research help for papers and homework assignments*
- *A big role*
- *E-resources play a large role in my education. While I am only a freshman, I use them for papers, and I am sure that I will continue to use them as I write more papers in the future.*
- *I continue to read them to attain knowledge about a topic or discussion I may have in class.*
- *They are very important! I rarely, if ever, use a print resource for research that is not a required text. Almost 100% of my used research for my college career has come through electronic databases. They are essential to the success of the modern day researcher.*
- *major*
- *They are an integral part of my education as a physics student and a scholar in general.*
- *half*
- *Huge*
- *research*
- *They are essential to writing research papers!*
- *information gathering for necessary assignments*
- *They help make a lot of things more convenient so it saves me time in the long run.*

- *A major role*
- *none*
- *Secondary sources for research papers.*
- *Required reading to aid in my understanding during lecture. Also, to use as references for assigned research papers, essays and exams.*
- *They help me get the information I need for class when I need it.*
- *They make it more accessible and quicker to find and read information.*
- *easier assess [sic] to information when needed but takes a lot of my money*
- *As much as possible, I prefer them to print sources*
- *They play a tremendous role on a daily basis. If it were not for the time I save utilizing e-resources, I might not be able to take classes while working full time.*
- *A large role. Without internet it would take much longer to track down pertinent information. That isn't to say that I do not use printed work for school, but I pretty much always find those printed works online before obtaining them in print.*
- *They necessary and vital, but sometimes a hindrance.*
- *They provide numerous resources that are helpful in completing my assignments and learning more about topics I'm interested in.*
- *They are essential.*
- *They're a significant part since they are often required in my classes and available on Blackboard.*
- *Primary source for academic papers and required course readings*
- *Comprise a good deal of my research, seeing as it's most expedient.*
- *major*
- *Highly Important and valuable for literary research - I could not do without them.*
- *I use them fairly often in some classes (i.e., online articles, writing blog posts for classes), but almost never in others. I don't find them to be any more particularly helpful or hurtful to my education either way. In the day and age in which we live, it's just becoming part of the daily routine.*
- *They help me learn about things that interest me.*
- *Research related*
- *They are the main source of my academic reading.*
- *They expediate the process of finding pertinent information and provide a much broader scope of information than roaming through physical copies of articles or information*
- *a major part*
- *Help support evidence in my projects*
- *They help with research and I also do a lot of homework online*
- *I have to use them for class papers and projects.*

- *E-resources play a tremendous role. Reading journal articles online is one of my primary research methods as I begin to work on my senior thesis.*
- *None*
- *better understand*
- *Most just databases for my musicology research*
- *Help me further my knowledge and understanding beyond just the material in class.*
- *They are helpful in doing research, and assist in doing challenging homework*
- *integral*
- *Provide useful information for academic research as well as personal interest in gaining knowledge*
- *I use them for research for lab reports, additional information while studying, additional understanding for material I am studying.*
- *E-resources are the double-edged sword of education. Information is retrieved more easily and more rapidly, but more is expected of the students because of this.*
- *A comparatively large role, though written sources important as well. Professors rely more and more on electronic sources.*
- *Weekly resource/ integrated assignments.*
- *Help me do homework, valuable sources of information, etc.*
- *None*
- *very important role*
- *They help me procrastinate on doing my work.*
- *Very Important.*
- *I do the majority of my research through online resources*
- *I have no clue what e-source is.*
- *none*
- *Research*
- *They play a large role. Many instructors make pdf files of required reading on-line.*
- *Makes classes quicker and more convenient. Easier to share information and get resources from instructors.*
- *Major in my education and in my life...*
- *I use e-resources for educational purposes frequently, mostly to keep track of my classes (for example, to get my homework assignments and midterm dates), but also to collaborate with friends on projects/homework, to share what I'm learning with friends, to obtain information related to my major that isn't being taught in my classes, and to turn in homework.*
- *Heavy influence on research*
- *Very important*
- *They are used to complete the assignments given me.*

- *They are absolutely vital to obtaining literature and creating or utilizing databases quickly and efficiently.*
- *A major role- I like to use print items but I do most of my research online or find print resources using the internet first*
- *preparing for class, assisting with homework*
- *I use them for research*
- *I use them quite often, because they help me find information that you sometimes cannot get anywhere else.*
- *I use them a lot for research.*
- *I prefer print sources, but in cases where the book is not available or it's just not feasible to obtain a print copy, I consult e-resources to get research for papers and reports.*
- *A very large role.*
- *Primary source of information for completing homework assignments, and videos that supplement lectures.*
- *They play an essential role.*
- *They help me with research papers and informative speeches.*
- *They play a large role.*
- *They make life much easier, so they are very important*
- *a very important role*
- *I use them to write articles, find out information about what goes on in business daily*
- *Almost daily use in classes, accessing online library, ArtSTOR, jstor*
- *very important for research*
- *Paper writing.*
- *huge role*
- *English core, that is it*
- *I use them for e-mail and research.*
- *Not very much. Occasional use, but many teachers still use print resources. Powerpoints are popular, but most other resources are not used or are for personal use.*
- *An important one*
- *Research*
- *E-resources usually are the foundation to the projects I do related to research.*
- *They give me information about what's going on in the world, which is not required in a class, but that I pursue on my own.*
- *They play a huge role in my everyday academics. They are reliable and enable me to complete my essays and journals with the content available. Overall, very helpful.*
- *They are necessary for research papers as well as speeches and presentations I am required to make.*

- *allow for greater breadth of resources*
- *HUGE! I depend on e-resources to complete many assignments in every class. I also use journal articles and websites for personal interest of academic topics.*
- *They help me gather credible information for papers and speeches.*
- *They are crucial in research for assignments.*
- *Not a strong role in education; more for personal entertainment*
- *It does a lot. I use it as a resource for almost every project or assignment.*
- *I use them in most assignments.*
- *they make it easier to obtain information*
- *I use them for research for my English papers.*
- *E-resources are the main resource I use to obtain information. Please note: I found this survey to be very limiting, not allowing enough choices for answers. Additionally, the survey's questions and responses were poorly written and at times difficult to understand.*
- *I very high role, I use the internet on most assignments i do.*
- *a huge role. They enable me to complete my research in a timely manner and also provide a source of leisure for when I need a break from studying.*
- *aids in research essential to keeping up-to-date with classes and assignments (blackboard)*
- *A very big role. I probably learn more on the internet than in class.*
- *None*
- *It does not play a role.*
- *They are more for my own education interests.*
- *They help the campus students collaborate.*
- *I use the internet for almost everything.*
- *not very much*
- *Usually none.*
- *Not a large one, I only use them if a class specifies so*
- *none*
- *Not a big role*
- *I use e-resources for reading assignments and paper assignments most often. They usually supplement my topics.*
- *Moderate role, good for sources on papers*
- *I use the internet for OED reference on occasion, Wikipedia for quick explanation and links for research, Google for quick reference and common knowledge, and eBay and Amazon for textbook purchase.*
- *None*
- *It does not.*

- *A large portion of my research and help with homework comes from online sources.*
- *They provide great convenience when writing papers.*
- *Not much of a role - unless there is assigned, mandatory online assignment (like homework or a quiz)*
- *A very important role. Most of my resources are online instead of print.*
- *I use them frequently*
- *Absolutely essential, I use e-resources daily to accomplish anything from research to help with difficult mathematics problems*
- *Help with homework and studying for exams*
- *I use the internet for research and to do my homework but nothing beyond that as far as my education goes.*
- *e-resources make it easier to find supporting information for work compared to hard copies*
- *E-resources make obtaining information easier and is often how I complete homework.*
- *They allow me to quickly look up information and answer simple questions without having to go to a professor or TA.*
- *important and easy to access*
- *I use non-scholarly resources like Wikipedia and the like to help me understand material quite often. Online math tools are also very helpful. I haven't needed to use scholarly articles yet*
- *I use my teacher's website to print out my lab assignments and I use blackboard for my English class.*

Value and use of books

- *They're everything... Books are so old fashioned... yes they are good in some cases because you can see the facts in their original sources but they are much less convenient and more expensive None, I prefer textbooks.*
- *Google has obsoleted textbooks*
- *My textbook are now all digital*
- *It is so much better than paper. mainly because of the weight like carrying it around and it is so much easier to search by keywords instead of topics*
- *I prefer not to use e-resources. I like to use written texts from physicals things such as books or newspapers.*
- *All of my nursing texts are electronic.*
- *That is where I get all my books or information*
- *HUGE role, however I am not fond of online text books.*

- *E-resources make compiling research and reports easier than trying to find a book resource. I work a lot so trying to find time to go to the library is difficult if not impossible. Although, I do feel that when I have time to use print resources my work is of higher quality. The reason is because when I can hold the book in my hands I am more likely to take my time and focus on the task at hand.*
- *They are great for quick searches for a paper or a starting point for book research for reading.*
- *They're necessary for my coursework.*
- *I use them occasionally since most of my instructors prefer book sources.*
- *Important role. However I would much rather read it in book form. There are not enough books in the library. And when the course leader gives the reading you have to read them online or print them.*
- *finding books*
- *A big role in terms of instant access to information. Although for in-depth learning, a physical book is preferred.*
- *If I need an article for a class I will access it through the library but I much prefer hard copies, it makes focusing either. I am not a fan of e-anything. I love books, I enjoy the feel of books, academic or otherwise so I minimize the time I spend reading something on the computer. If I can print it, I will print it and make notes there rather than on-screen.*
- *A large role, for example, before I purchase a book, I look it up online to determine if I find it worth the cost.*
- *They play a huge part in my education. I rarely, if ever, read from books.*
- *a few of my course textbooks have online versions and the majority of my homework is restricted to the web*
- *They are the fastest way for me to find information about a topic. I will use general searches in databases and search engines to find keywords that help me narrow my topic. I have read electronic and printed books this year.*
- *E-books are terrible. The worst thing ever; I would rather buy a book I will own in my library or resell; e-books are just a way to take my money and give me no voice in my learning; worst idea ever.*
- *Very important. Pretty much all I use. E-books are great because they don't waste paper and I don't have to carry around giant paper books.*
- *A big role. If I need to find something, I will usually look for it on the internet unless an assignment says I need to have a book source.*

Use of social media

- *Pretty damn important. Databases make it quick to find scholarly resources, especially with library aides if I'm struggling in the search. It's easier to Facebook or email group members for projects, or set up Google Docs to collaborate on something. YouTube makes video projects easy - no DVD is strictly necessary. I've filmed on an iPod once and uploaded straight to YouTube. Teachers have me do posts on discussion boards a lot, too, and it's pretty convenient since I don't have to worry about printing. If I miss class and need to turn in an assignment, I can sometimes email the teacher my assignment, or use Dropbox on Blackboard. Blackboard is really great, especially when TEACHERS USE THE GRADING FEATURES. Good survey!*
- *I use the internet, library databases and electronic articles (from e-databases) very extensively. I really don't have time to use e-resources more attune to social media.*
- *When studying for [science] tests, I frequently supplement the course material with Wikipedia. I frequently search for videos online that explain concepts I have trouble grasping. I frequently obtain pdfs of articles through the library via an off-campus VPN. One of my required textbooks is an e-book. However, I paid extra to receive a print copy. Any lengthy e-text (e-book, pdf, etc.), I prefer to read in print. I frequently use a variety of computer programs in my education including R, simulation software, SPSS, e-flashcards, and a computer e-book reader. Last semester I had a course that relied heavily on e-resources including an e-book text, required blogging, required microblogging, and simulation software. Though each of the resources were at least minimally adequate, I felt the unconventionality of the course made it unnecessarily difficult to learn the material. I study primarily off lecture slides that instructors post online.*
- *YouTube lectures can be exceptionally helpful and interesting and I use [my university's] webpage, especially the library search engine, a lot.*
- *I use the library database several times a week. I find and share interesting or current journal articles on Flipboard and Facebook daily.*

Use of mobile screens

- *I use my iPhone every week in discussion class to reference the required readings for that class*
- *Very big, The nursing department switched all its books to e-books thus our reading materials is read on the computer screen, iPad, iPhone, Android or other type of devices*
- *My text books are on my e-reader. My news articles are on my mobile device and computer/tablet.*

Overall, the comments show a dependence of e-resources by undergraduate students. The advent of new technology and the adaptation of the technology into coursework have made it almost essential for students to have access to e-resources to complete their coursework. Students appreciate the convenience and accessibility of e-resources, including those provided by the library, and e-resources are quickly becoming the first and often only source of scholarly information.

Role of Library Collections

We re-categorized how someone obtains scholarly reading material into three basic categories: library-provided, personal subscription/purchase, and other. Library-provided includes readings from the library's print or electronic collections, interlibrary loan, and school/department subscriptions. The other sources include free web journal, publisher, course reserves, and a colleague. Most scholarly article readings are obtained from other sources (57%), including 23% obtained from a free web journal, and we assume some of these are actually library-provided subscriptions but undergraduates are not always able to distinguish what is free on the web with library-provided. Forty percent of article readings are obtained from the library, and 22% of book readings are obtained from a library collection (Table 34). Only 4% of article readings are obtained from a personal subscription, while book readings are most likely to be purchased (66%).

Table 34. Source of Reading by US Undergraduate Students

	Article		Book	
	N	**%**	**N**	**%**
Library-provided	213	39.6	102	22.2
Personal source	19	3.5	303	65.9
Others	306	56.9	55	12.0
Total	538	100.0	460	100.0

The library's collections provide access to older articles in addition to the current collections. Readings from older articles are more likely to be from a library collection (χ^2=47.189, p<.0001). Thirty-one percent of the library-provided articles are in their first two years of publication (Table 35). Regardless of the age of the publication, the majority of library-provided articles are from its electronic collections. Seventeen percent of the library provided articles are over fifteen-years-old, while none of the articles obtained from a personal subscription and 10% of those obtained from another source are over fifteen-years-old. Readings from a personal subscription are most likely to be in their first year of

publication (84%). Our findings show the library's back files in addition to current subscriptions are a key investment.

Table 35. Association between Source of Article and Year of Publication for US Undergraduate Students

	Library Provided	Personal Subscription	Others	Row Total
Over 15 years (Before 1997)	32 16.8%	0 0%	27 10.0%	59 12.3%
11 ~ 15 years (1997-2001)	15 7.9%	0 0%	9 3.3%	24 5.0%
6 ~ 10 years (2002-2006)	32 16.8%	1 5.3%	38 14.0%	71 14.8%
2 ~ 5 years (2007-2010)	53 27.9%	1 5.3%	72 26.6%	126 26.3%
One Year (2011)	23 12.1%	1 5.3%	31 11.4%	55 11.5%
Less than 1 year (2012)	35 18.4%	16 84.2%	94 34.7%	145 30.2%
Column Total	190 100.0%	19 100.0%	271 100.0%	480 100.0%

We found a significant association between the principal purpose of reading and the source of the article reading (χ^2=95.793 and p<.0001) and source of the book reading (χ^2=108.950, p<.0001). Library-provided articles most likely are read to help complete a course assignment or course paper (63%), while only 40% of articles from other sources and 11% of those obtained from a personal source are read for a course assignment or paper. An additional 21% of library provided articles are read for required reading, and 6% for thesis or dissertation work. Forty-two percent of the articles provided by personal subscription are to keep informed about a field of study. Thirty-seven percent of personal subscription and 23% from other sources are just of personal interest, while only 4% of library-provided articles are for personal interest. Overall, library-provided articles support course activities more than articles obtained from other sources.

While the majority of book readings obtained from a personal source (79%) and other source (71%) are required readings, only 36% of library-provided books are required readings. Instead, library-provided book readings help complete a course assignment or course paper (45%), while only 10% of the purchased books and 11% of the books from other sources help complete a course assignment. Since the library does not usually carry textbooks (required readings), that explains why there is a lower percentage of library-provided article and book readings; instead, what it shows is that students turn to the library for course material because they depend on the library for material to support course work but not specifically assigned.

One measure of value of the library for scholarly work and the research can be represented by how many hours per year each undergraduate student dedicates to library-provided reading. Earlier in the report we looked at the *exchange value* of scholarly reading, and in this section we narrow it to look at the exchange value of library-provided readings. We measured the library's value by the time spent using library reading material, assuming that scholarly readings are important for quality undergraduate work and their professional development. We can illustrate the total amount of reading by each undergraduate student by using a simple formula of time spent reading each material multiplied by the number of each material read per month multiplied by 9 to calculate a school year total.[9] We then multiple the total amount by the percent obtained from the library to determine the number of hours per 9-month year each undergraduate student devotes to library-based work (Table 36).

[9] Excludes outliers.

Table 36. Value of Library Resources to US Undergraduate Students

	Time per reading (in minutes)	Number read per month	Multiplied by 12 months	Percent from library	TOTAL
Article	28	15	9	.40	25 hours
Book	176	6	9	.22	35 hours

Of the 158 hours undergraduate students spend on book readings each 9-month school year, they spend approximately 25 of those hours dedicated to library-provided book readings. They spend approximately 25 hours on library-provided article readings of the 63 hours dedicated to article readings from all sources. In an average school year, undergraduate students spend 60 hours of their work time with library-provided material, or the equivalent of 7.5 eight-hour days. Clearly, the amount of time spent reading library-provided material has a profound impact on the quality and focus of undergraduate work.

We assume that undergraduate students spend less time per academic year (nine months) with library-provided articles and books compared to faculty and graduate students in the United States. Faculty spend approximately 76 hours with library-provided articles, while graduate students spend 143 hours in a year (12 months), while undergraduates spend only 25 hours per nine-month academic year. Faculty also spends around 40 hours per year (12 months) and graduate students spend around 59 hours per year on library-provided books, undergraduate students spend on average only 35 hours per nine months dedicated to library-provided books. These differences are because undergraduate students obtain fewer articles (40%) from the library than graduates (60%) and faculty (55%), and read fewer articles than graduates (M=29) and faculty (M=21). Undergraduates also obtain fewer books (22%) from the library than graduates (32%) and

faculty (28%) and read fewer books than faculty (M=7). Graduate students read approximately the same number of books per month as undergraduates (6).

The library is an important resource for scholarly books and articles for undergraduate students. They often face strict personal budgets and are pressed for time, and the library's collections, in particular its e-collections, provide free resources in a timely manner. By expanding the amount of resources they have available to them through the e-collections, the library can further their professional development and improve the quality of work at the university.

Scholarly reading will remain a vital part of undergraduate work, as the students increase their knowledge in their field, work on their own research, and start out in their academic career. Maintaining the quality of the library's collections will enable the budding professionals to have access to important information, and will improve the future of the academic endeavor.

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Copy of Survey

Section 1: Scholarly Article Reading (print and online)

1. In the past month (30 days), approximately how many scholarly articles have you read? Articles can include those found in journal issues, websites, or separate copies such as preprints, reprints, and other electronic or paper copies. Reading is defined as going beyond the table of contents, title, and abstract to the body of the article. Number of articles read (including skimmed) in the past month:
   _____

2. Approximately how many of these articles were for a class?
   _____

   The following questions in this section refer to the SCHOLARLY ARTICLE YOU READ MOST RECENTLY, even if you had previously read this article. Note that while this last reading may not be typical, it will help to establish the range of patterns in reading behavior.

3. What is the title of the journal from which this last article was read or, if not from a journal, what is the topic of the article?
   _____
   _____
   _____

4. What year was the last article you read published/posted?
   _____

5. How thoroughly did you read this article?
   - o I read all of it with great care
   - o I read parts of it with great care
   - o I read with attention to the main points
   - o I read only specific sections (e.g., figures, conclusions)
   - o I skimmed it just to get the idea

6. For what principal purpose was this article read? (Choose only the best answer)
    - o This article was required reading in a course
    - o I read this article to help complete a course assignment or a course paper (but it was not specifically required)
    - o This article was for my thesis or dissertation
    - o I read this article to keep informed about the developments in my main field of study
    - o This article was just of personal interest
    - o Other (please specify): _____

7. How did you become aware of the last article you read?
    - o Found while browsing (without a specific objective in mind)
    - o Found while I (or someone on my behalf) was searching (e.g., by subject or author's name)
    - o Cited in another publication
    - o An instructor told me about it
    - o It was in the course outline / reading list
    - o Do not know / Do not remember
    - o Other (please specify): _____

8. Found while browsing:
    - o Personal print subscription
    - o Personal online subscription
    - o Library print subscription
    - o Library online subscription
    - o School, department, etc. print subscription
    - o School, department, etc. online subscription
    - o Website
    - o Other (please specify): _____

9. Found while I (or someone on my behalf) was searching:
    - o Web search engine (e.g., Google or Google Scholar)
    - o The databases available on the library website
    - o Print index or abstract
    - o Online journal collection (e.g., HighWire, JSTOR)
    - o Other (please specify): _____

10. After you became aware of this article, from where did you obtain it?
    - o Personal subscription
    - o Library subscription
    - o School, department, etc. subscription
    - o Free web journal
    - o Copy of the article from a colleague, instructor, author, etc.
    - o Interlibrary loan
    - o An author's website
    - o Course reserves
    - o Other website
    - o Other (please specify): _____

11. This source was:
    - o Print
    - o Electronic

12. How long did you spend reading this last article?
    In minutes: _____

13. Had you previously read this article, i.e., is this a re-reading?
    - o Yes
    - o No

14. In what format was the article when you read it?
    - o Print article in a print journal
    - o Photocopy or fax copy
    - o Online computer screen
    - o Previously downloaded / saved and read on computer screen
    - o On a mobile, e-reader, or tablet screen
    - o Downloaded and printed on paper
    - o Other (please specify): _____

15. Thinking back to the source of the article, where would you obtain the information if that source were not available (e.g., library or personal subscription, archive, etc.)?
    - o I would not bother getting the information
    - o I would obtain the information from another source

16. What sources did you use the last time you needed important information? (Check all that apply)
    - ☐ A website
    - ☐ Journal article
    - ☐ Magazine article
    - ☐ Book or book chapter
    - ☐ A friend or someone I know
    - ☐ An instructor
    - ☐ A librarian
    - ☐ Other (please specify): _____

Section 2: Book Reading (print and online)

17. In the past month (30 days) approximately how many books or parts of books did you read for school work? Include reading from a portion of the book such as skimming or reading a chapter. Include books read in print or electronic format. (If none, please enter "0" instead of leaving a blank.

    _____

    The following questions in this section refer to the BOOK FROM WHICH YOU READ MOST RECENTLY. Note that this last reading may not be typical, but will help establish the range of patterns in reading behavior.

18. What is the approximate title or topic of the book from which you last read?

    _____
    _____
    _____

19. About how much total time (in minutes) did you spend reading this book in the past month?

    _____

20. How did you become aware of this last book from which you read?
    - o Found while browsing (without a specific objective in mind)
    - o Found while I (or someone on my behalf) was searching (e.g., by subject or author's name)
    - o Cited in another publication
    - o An instructor told me about it
    - o It was in the course outline / reading list
    - o Do not know / Do not remember
    - o Other (please specify): _____

21. After you became aware of this book, from where did you obtain it?
    - o I bought it for myself
    - o The library or archive collection (including main or branch)
    - o Interlibrary loan or document delivery service
    - o School or department collection (e.g., not managed by library)
    - o A colleague, author, or other person provided it to me
    - o A free, advanced, or purchased copy from the publisher
    - o Other (please specify): _____

22. In what format was the book when you obtained it?
    - o Print
    - o Electronic

23. For what principal purpose was this book read? (Choose only the best answer)
    - o This book was required reading in a course
    - o I read this book to help complete a course assignment or a course paper (but it was not specifically required)
    - o This book was for my thesis or dissertation
    - o I read this book to keep informed about the developments in my main field of study
    - o This book was just for personal interest
    - o Other (please specify): _____

24. How important is the information contained in this book to achieving your principal purpose?
    - o Not at all important
    - o Somewhat important
    - o Important
    - o Very important
    - o Absolutely essential

25. In what ways did the reading of the book affect the principal purpose? (Choose all that apply)
    - ☐ It improved the result
    - ☐ It narrowed / broadened / changed the tone
    - ☐ It inspired new thinking / ideas
    - ☐ It resulted in collaboration / joint research
    - ☐ It wasted my time
    - ☐ It resulted in faster completion
    - ☐ It resolved technical problems
    - ☐ It made me question my work
    - ☐ It saved time or other resources
    - ☐ Other (please specify): _____

Section 3: Social Media

26. How often do you read / view / participate in each of the following electronic / social media for school related purposes?

	Daily	**Weekly**	**Monthly**	**Occasionally**	**Never**
Blogging (e.g., WordPress, Blogster)	○	○	○	○	○
Microblogging (e.g., Twitter)	○	○	○	○	○
RSS feeds	○	○	○	○	○
Social networking (e.g., Facebook)	○	○	○	○	○
Social tagging (e.g., Delicious)	○	○	○	○	○
Collaborative authoring (e.g., Google docs, CiteULike)	○	○	○	○	○
User comments in articles	○	○	○	○	○
Image sharing (e.g., Flickr)	○	○	○	○	○
Audio sharing (e.g., Podcasts)	○	○	○	○	○
Video sharing (e.g., YouTube)	○	○	○	○	○

27. How often do you create each of the following electronic / social media tools for school related purposes?

	Daily	**Weekly**	**Monthly**	**Occasionally**	**Never**
Blogging (e.g., WordPress, Blogster)	○	○	○	○	○
Microblogging (e.g., Twitter)	○	○	○	○	○
RSS feeds	○	○	○	○	○
Social networking (e.g., Facebook)	○	○	○	○	○
Social tagging (e.g., Delicious)	○	○	○	○	○
Collaborative authoring (e.g., Google docs, CiteULike)	○	○	○	○	○
User comments in articles	○	○	○	○	○
Image sharing (e.g., Flickr)	○	○	○	○	○
Audio sharing (e.g., Podcasts)	○	○	○	○	○
Video sharing (e.g., YouTube)	○	○	○	○	○

Section 4: Demographics

This section is about you. The purpose of collecting this information is to give us the opportunity to search for additional meaningful patterns in the collected data. You are almost finished!

28. What is your academic status?
    - o Freshman
    - o Sophomore
    - o Junior
    - o Senior
    - o Other (please specify): _____

29. What is your major?

    _____
    _____
    _____

30. What is your age?

    _____

31. Are you:
    - o Male
    - o Female

32. Are you a full- or part-time student?
    - o Full-time
    - o Part-time

33. What role do e-resources play in your education?

    _____
    _____
    _____

You've reached the end of the survey. We appreciate your participation. Thank you!