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Student Use of Library-Provided Materials in EdD Dissertations

One of the tools collection managers can use to guide the selection and retention of books and journals is citation analysis. Although time-consuming to collect and analyze, citations by library users provide compelling evidence for keeping certain titles or growing collection support for specific subject areas, and may provide a good sense of which materials may be safely weeded. In addition to these purposes, citation analysis can give an indication of how well the collection is meeting the needs of the students and faculty of the home institution.

As Ashman (2009) points out, the majority of citation analyses focus on the literature of a discipline, by particular user groups, and/or by format. In fact, many are undertaken to evaluate library collections by focusing on highly-used serials and the relative breakdown of citations to serial versus monographic literature. One particular group of authors often studied are graduate students who produce theses and dissertations, and they are studied from single or multiple institutions as well as individual fields, interdisciplinary, and multidisciplinary studies. Well-known examples of these kinds of citation analyses include a study of Workforce Education and Development theses and dissertations by Waugh and Ruppel (2004), Kuyper-Rushing's (1999) study of music dissertations, Buttlar's (1999) examination of library and information science dissertations, and an analysis of philosophy dissertations undertaken by Herubel (1991). Nearer to the subject of the present study, citation analyses of theses and dissertations in the field of education have been conducted by Haycock (2002), Condic (2015), and Griffin (2016).

Another area of interest for researchers has been whether there is congruence between the materials cited by graduate students and those cited by their faculty. McCain and Bobick (1981), Edwards (1999), and Knievel (2013) indicate overlapping interests between graduate students and their faculty advisors, and Zipp (1996, 340) finds that thesis and dissertation citations "are better indicators of faculty use than has been previously assumed." The advantage for collection managers would be in confirming that the titles they identify would serve multiple local user communities.

Although some authors of citation analyses have used resulting journal lists to validate the subscription decisions for their host library, Beile, Boote, and Killingsworth (2004) issue a cautionary finding: dissertation writers seem much more likely to cite materials that are available locally than to include items only available to them by interlibrary loan or other means. This finding suggests that that librarians should not be too quick to judge the success of library collections based solely on what materials are cited in theses and dissertations. Accepting the caveat, though, citations do provide valuable insight into what library materials are getting used. As Sherriff (2010, 165) describes them, citations are "objective quantitative data" which can contribute to collection management decisions, and the citation analysis itself is an unobtrusive method which complements information drawn from other methods (Sylvia, 1998).

Background

East Carolina University enrolled approximately 26,500 students for the Spring 2019 semester, and employed about 2,000 faculty members. The University offers more than 70 master's degree programs, 13 research doctoral programs, and six first professional programs (AuD, DMD, DNP, DPT, EdD, MD). The College of Education, whose EdD graduates are the subject of the present study, awarded 650 of the 6,664 graduate and undergraduate degrees awarded during the 2017-2018 year. EdD graduates accounted for 24 of them last year, and 135 over the prior eight academic years (ECU Fact Book).

ECU's College of Education participates in the Carnegie Project on the Education Doctorate (CPED), which has a direct bearing on the Ed.D. students' course of study and subsequent dissertation. The CPED framework is designed to produce "Scholarly Practitioners" who "use practical research and applied theories as tools for change" as they solve local and contextual "problems of practice." Consequently, the dissertations produced by EdD graduates are expected to be scholarly works which "[impact] a complex problem of practice" ("The Framework" 2019).

The College of Education is served by J. Y. Joyner Library, which offers access to some 2.6 million titles, roughly 450 databases, and about 90,000 online journals. The number of physical items in the general stacks is just under 690,000, and print

monographs in the L's make up a modest proportion of the items at about 35,000. Library collections have benefited from opportunities at times during the last ten years to purchase online backfiles for many of the publisher packages, and has managed to maintain current publisher packages for the five largest journal publishers. Although serials and databases are centrally funded, monographs are served by firm order funds, an approval plan, and both print and electronic demand-driven acquisitions (DDA) plans. Despite a few years of growth, the general trajectory of the monograph budget has been declining over the last decade, in part because the library has been using more of its financial resources to preserve serials and fulltext databases. The library has also seen monograph purchasing activity shift during the time period by adding and increasing DDA plans while reducing the approval plan and trimming firm order budgets.

Purpose

With the changes in the library's acquisitions budgets and purchasing patterns, the authors wanted to confirm materials support for one of the most prominent programs on campus. In order to gauge that support, we decided to gather and analyze the citations from the reference lists of 106 dissertations written by Ed.D. graduates of the Educational Leadership program during calendar years 2010 to 2016.

The objective of this analysis mirrors that of Iivonen et al. (2009) to demonstrate the impact of university library's collections on one department's research output by asking two central questions. First, how much of the materials they cited did the library provide access to? Second, for books and journals cited, does the library provide print or electronic access, or both?

Methodology

Hoffman and Doucette (2012) provided a review of citation methodologies, honing in on the most common approaches, to study the type of resources cited, age, frequency of journal titles cited, and library holdings. These same areas of interest were the focus of the current study. Citations from the bibliographies were extracted from all dissertations submitted to the College of Education, Department of Educational Leadership from the years 2010 to 2016. There were a total of 106 dissertations submitted during this time, with a total number of 14,284 citations across all dissertations. The average number of citations per paper was 135, with a range from 34 to 441. Citations were entered to Excel and first grouped by type, including Journal, Book (including chapters), and Other. Then, library access was checked to cited books, journal articles and issues, in the library's e-journal portal and catalog. Researchers were interested in library collections' access to books and journals cited, including the format offered, the number of times individual journal titles and books were cited, whether the library owns alternative editions of non-owned books, and the ages of the items cited. The age of item cited was calculated by noting the year of the dissertation and subtracting the copyright year of the publication (which could result in an age of 0). Researchers were also interested in whether the library has current access to unique journal titles, especially those which were highly-cited in the present study.

A limitation on the current study is that library holdings may have changed since the first dissertations were being written to the time the study was conducted. In particular, cited books may have been weeded or added, print journals have been weeded, and online journal access may have changed, due in part to aggregator access. For online journal access, the reported results do not distinguish between subscribed or aggregator access.

Results

The dissertations' 14,284 citations were divided into Journals, Books, and Other. The largest usage category was for Journals with 6,209 article citations (43% of the total citations); Books and chapters accounted for 3,996 citations (28%); and Other citations numbered 4,079 (29%). Citations will be broken out below by category, to examine in particular library-provided access to journals and books, the format of access (online, print, or both), the age of the items, and duplication among titles cited, among other indicators specific to journals and books.

Journals

Of the 6,209 journal citations, the library provided access to 5,803, or 93%, of those citations, and offered no access to 406, or 7% of the citations. Electronic format was available for 5,203, that is, 84% of the total number or 90% of the library-provided 5,803 citations, and both print and online formats are available for 502 citations, or 8%, while the library offers print holdings only for 98—less than 2%. See Table 1: Format for Library Holdings by Citation.

These 6,209 citations refer to 1,380 unique journal titles. Online access is by far the most heavily used format, accounting for all library holdings for 1,022 of these titles. Joyner offers both print and online for 90 titles, and only print for just 25 of the 1,380 individual titles. For 243 titles, the library did not offer any of the cited articles. See Table 2: Format for Library Holdings by Journal Title.

Further, for 1,099 of the titles, we own all of the cited articles, for another

Table 1: Format for Library Holdings by Citation

Format	Number of Citations	Percentage of Total
Online	5,203	84%
Both Print and Online	502	8%
Print	98	2%
Not Applicable/Not Held	406	7%
Total Number of Citations	6,209	

Table 2: Format for Library Holdings by Journal Title

Format	Number of Titles	Percentage of Total
Online	1,022	74%
Both Print and Online	90	7%
Print	25	2%
Not Applicable/Not Held	243	18%
Total Number of Titles	1,380	

38 we own some of the cited articles, and for only 243 does Joyner Library have no holdings at all. Of these 243 non-accessible titles, 190 of them were used only once. Conversely, the highest number of citations to a title not offered through the library's E-Journal Portal was 16, to the *Online Journal of Distance Learning Administration*. It is significant to note that the *Online Journal of Distance Learning Administration*, published by the University of West Georgia, is freely available online. While the library includes journals from the *Directory of Open Access Journals* and some other open access (OA) titles in the E-Journal Portal, not every OA journal is included. Of the 1,380 titles, the library maintains current access to 1,004, or 73% of them, while 376 are not current.

The most heavily used title is *Educational Leadership*, with 232 citations, followed by *Phi Delta Kappan*, with 139. The top 20 titles account for 24% of all citations, and the top 35 titles account for about a third of the use, at 32% of cited articles. Overall these journals seem to be a good fit for the scholar-practitioners that a CPED program produces. Only 219 titles were used more than 5 times, and only 1/10th of the titles were used 10 or more times. Of the 1,380 titles, more than half—735—were used only once. Single use titles include newspapers, journals from other disciplines, and titles from specialized sub-disciplines of education. The list in the figure below offers "practical research and applied theories" which help the Ed.D. graduates demonstrate that theirs are "dissertations of practice" which are oriented toward solving local systemic problems, as the CPED intends. See Figure 1: Top 20 Titles by Use.

For both journal articles and books, the age of the item cited was calculated by subtracting the year published from the dissertation year. The average age for all article citations was 12.65 years and the median was 9, while the mode was 5. To reach 80% of articles cited, the age range would need to extend from zero to 18 years, although the usage by age drops off rather dramatically after the median. For more information, see Figure 2, Age Distribution for Articles Cited.

Books

The EdD dissertations included 3,996 citations to books and chapters. There were occasions on which the same author cited multiple chapters within the same book; those were collapsed to a single entry on the book title. Varying editions were counted independently. There were 558 books which were cited by multiple dissertation authors, including across multiple editions. As expected, though, the largest number of titles, 2,324, were only cited by a single dissertation author. The overall number of unique titles, then, is 2,882. Of the unique titles, the library owned 1,351 (or 47%) and did not own 1,531 (or 53%). Across the 1,351 held titles, the library formats were 1,021 print only, 139 online, and 191 books were available in both print and online format. Since the corresponding percentage of print holdings is 76%, this shows a distinct
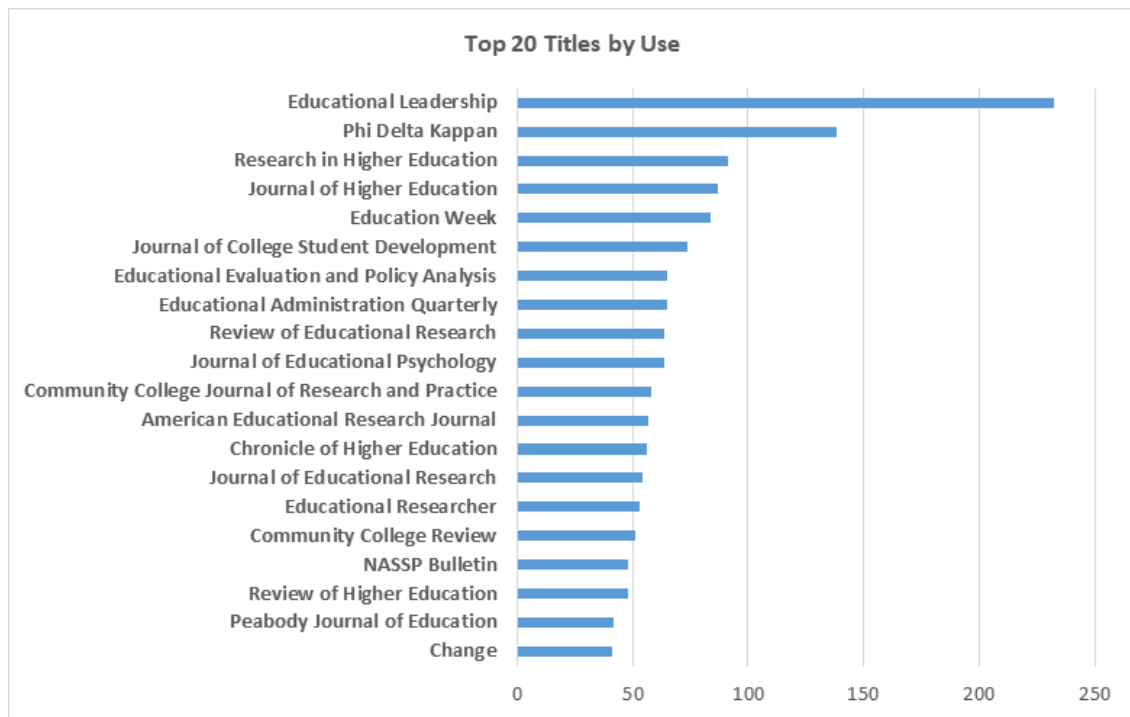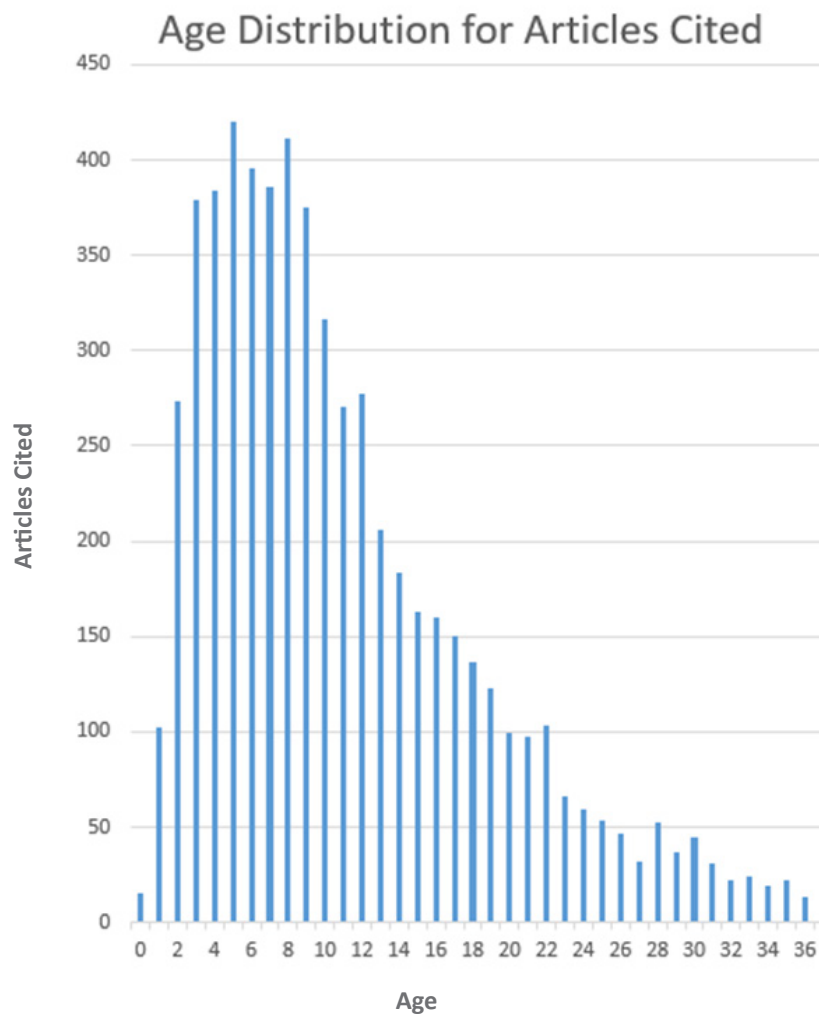
Figure 1

Top 20 Titles by Use

Figure 2


Age Distribution for Articles Cited

preference for print monographs, compared to journal usage. See Table 3, Format of Library Holdings by Book Title.

Of greatest interest to the authors are the 558 books which were cited by more than one dissertation author. For this subset, the library was more likely to own a copy: we held 316 of the 558, or 57%. Another characteristic of these books that the authors were interested in is, for books that had multiple editions cited, how often did the library own an alternative edition? It turns out, more than 70% of the time: there were 116 books not owned which included multiple editions, and of those, the library did own an alternate edition 84 times.

The age of books cited was somewhat older than that for journals: the mode was 8, while the median was 11. The mean was 15.7 years, and the standard deviation was 14.71. Book ages one to 23 captured 80% of the citations—this distribution is larger than the distribution of journal ages, confirming the need to be more cautious weeding books. See Figure 3, Age Distribution for Books Cited.

Of all items cited, only 34% were older than the mean, reflecting the skew of a relatively small number of the oldest books. The oldest book cited was *Webster's Dissertations on the English Language* (1798), at 216 years, and the next oldest was Philbrick's "The examination of graded schools" in *Educational Addresses and Pamphlets in Teachers College Library*, from 1876.

Figure 3

Age Distribution for Books Cited
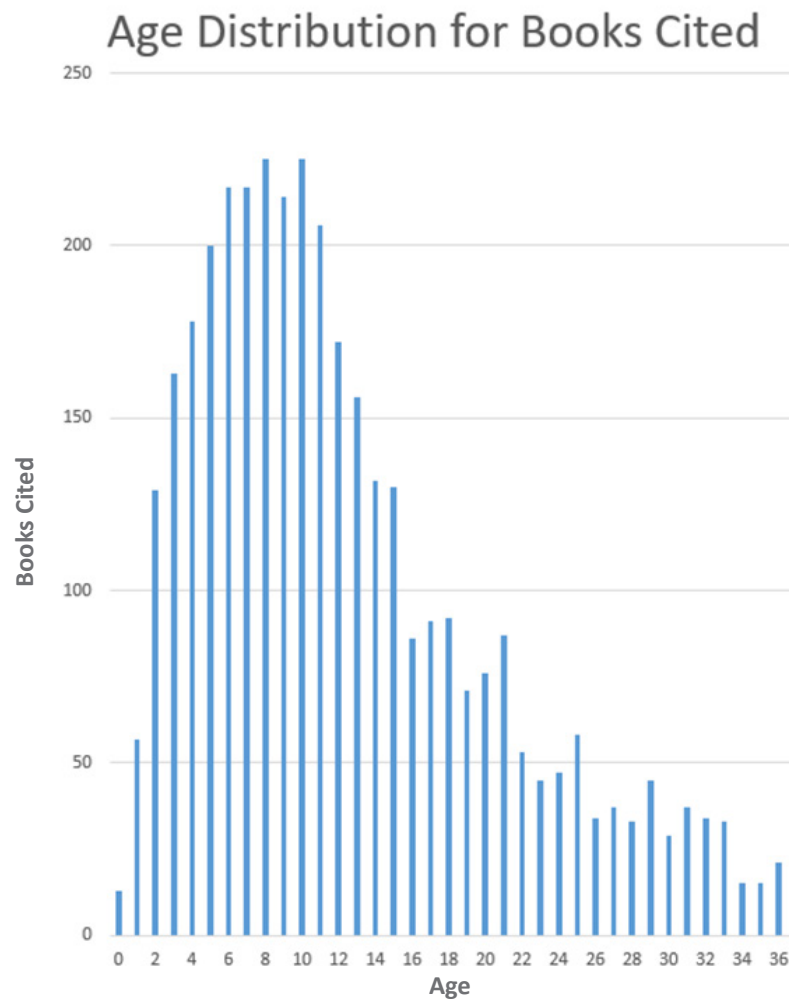
Dewey's "The Influence of the High School Upon Educational Methods" (1895) was the third oldest item. Other cited books now out of copyright included W.E.B. DuBois's *The Souls of Black Folk*, Taylor's *Principles of Scientific Management*, and works by Sigmund Freud (referenced in *The Standard Edition of the Complete Psychological Works of Sigmund Freud*). Joyner Library provided access to only

8 of those 21 works, 6 in print. Many of them—including the ones that the library owns in print—are also available in Project Gutenberg and/or HathiTrust.

On the other end of the age spectrum, there were only 13 citations to books with zero age—that is, the item was published the same year the dissertation was submitted to the institutional repository. Out of these 13,

Table 3: Format of Library Holdings by Book Title

Format	Number of Book Titles	Percentage of Total
Online	139	5%
Both Print and Online	191	7%
Print	1,021	35%
Not Applicable/Not Held	1,531	53%
Total Number of Titles	2,882	

Joyner Library provide access to 4 of them (3 print and 1 online). And we provided access to 20 of the 57 book citations with an age of 1 year. Because the library was more likely to own books after one year, perhaps there was a lag in our firm order and approval processes.

Other

Items cited in the Other category included white papers, reports, websites, ERIC and other government documents, and theses/dissertations. The total number of Other citations, at 4,077, represents 29% of the total number of citations. The ERIC document citations often included a URL, confirming the authors' conjecture that they were accessed online rather than by using the library's fiche or ILL. Government documents cited included various reports from federal and state Departments of Education and some state statutes, among others. Regarding citations to dissertations and theses, Joyner Library does provide access to ProQuest's Dissertations and Theses Global, but this database is not a subject of the current study, and dissertations and theses may also be accessed from institutional repositories or other online sites.

Implications for Library Collections and Services

Studies like this can provide valuable information for making collection development decisions, such as showing the ratio of use for books versus serials, with implications for the monograph budget, considering new subscriptions or topics to cover for monograph selection, or weeding. The way the authors conducted the present study did not include Interlibrary Loan activity because we chose only to look at use of the existing collection.

Citation studies such as this one can also impact decisions for future subscriptions and/or weeding of existing journals. Of the 375 journal titles that the library does not currently subscribe to, the ones with the largest number of citations might be considered for new subscriptions. Fully 74%, 278 of these non-subscribed titles, were cited only once. Only 19 of these titles have more than 5 uses (fitting comfortably below an ILL threshold), and of those 19, we have embargoed access to 2; 5 of them have ceased publication; 2 are freely available online; and 9 have had a title change—to which we do subscribe. This leaves one journal to consider for a subscription. See Table 4: Non-Subscribed Journals Used More than 5 Times.

For weeding journals, collection managers can consider the mean, median, and mode of articles cited. As a reminder from above, the mean for all article citations was 12.66 years; the median was 9; and the mode was 5. The most aggressive weeding practice would not, then, weed any print journal volumes younger than 5, and the most conservative weeding practice would account at least for the mean, at 12.66 years, rounding up to 13.

Considering journals which the library holds in print (including journals held in both print and electronic formats), the average age goes up slightly 13.43 years. It is likely that the older age for cited print occurs at least in part because so many of our print journal subscriptions have been cancelled in favor of online, greatly decreasing the number of recent years available in print in the library. Based simply on the increased age of cited print items, though, librarians might try to retain at least 14 years when weeding print journal volumes. A more likely scenario, though, is that librarians at ECU would consider instead the median, at 9 years, when weeding print. This is similar to the "Aggregate Cited Half Life for Education and Educational Research journals" in the 2017 *Journal Citation Reports*, which was 9.1 years. The considerations for weeding books based in part on age were addressed above.

Retaining highly-cited journals in the event of a cancellation is another concern for collection management librarians. Of course, collection managers would also consult departmental faculty and additional resources, such as *Journal Citation Reports* alongside the highest cited titles from the dissertations. But if, as Zipp (1996) asserts, the most heavily cited journals by dissertation writers are also the most heavily cited by faculty, this citation analysis will provide good guidance.

In examining highly-cited journals, the 80/20 Rule does not apply—first

Table 4: Non-Subscribed Journals Used More than 5 Times

Title Status	Number of Journals:
Ceased	5
Changed Title	9
Embargoed Access via existing database	2
Freely Available Online	2
Subscription Candidate	**1**
Total:	19

described by Trueswell (1969), this "rule" suggests that 20% of the journal titles would account for some 80% of the use. In several recent citation studies, though, the 80/20 rule is found insufficient; Nisonger (2008) suggests that Bradford's Law is more applicable. Beile, Boote, and Killingsworth (2004), among others, have found evidence in their citation studies for Bradford's Law to describe title dispersion. Specifically, Bradford's Law posits that serials may be divided into at least 3 "zones" of productivity in terms of numbers of articles cited that are central to the subject at hand, and the distribution would be 1 : n : n2 (in Nisonger 2008, 73). The present study also fits Bradford's Law: each third of citations requires exponentially more titles to attain. The top 35 titles capture 32% of all citations, at 1,986. The next 34% of citations, 2,101, are fulfilled by 159 titles. The remaining 34% of citations, 2,122, require 1,186 titles. For more information, see table 5: Journal Title Distribution by Number of Citations. The present study does not attempt to create a core list of journals for East Carolina University. However, the prevalence of publisher packages also has an influence to consider as collection managers determine which titles must be protected and which may be cancelled. Of the top 20-used journals, four are available to ECU students in aggregators, one (the *Chronicle of Higher Education*) is an individual subscription, two are in Project Muse, and the other 13 are found within publisher packages that the university

subscribes to. If the library were forced to break up these publisher packages, maintaining these as individual subscriptions would present additional challenges. The influence of journal bundles on serials budgets has been well-documented in the literature, but has not been taken into account with other citation analyses.

Format for books and journals diverged more greatly than the authors expected. The distinct preference for online access to journal articles was no surprise. Indeed, Joyner has invested significantly in expanding access to online journal content, including backfiles, and then weeding print for JSTOR or other owned backfile collections. However, the 3:1 preference for print to online access for books came as something of a surprise as we have also been adding more ebooks and ebook packages, and reducing print monograph budgets. Collection managers might need to be more cautious about abandoning print purchases until reading patterns also change.

Textbooks were cited with some frequency, including Creswell's *Designing and Conducting Mixed Methods Research*, cited by 37 of the 106 authors across 4 editions, and Yin's *Case Study Research Design and Methods*, cited in 24 dissertations across 5 editions. One of the issues that textbooks bring up is varying editions—the library might own some of the editions cited but not all. Whether to purchase textbooks and whether to order each succeeding edition is an issue libraries have

struggled with. Other books that were cited by multiple authors included books on qualitative data and methods, and books on statistical analysis. Multiple dissertation authors also referred to classics such as Burns's *Leadership* and recent widely-read books like Senge's *The Fifth Discipline*. Joyner Library collection managers will seriously consider obtaining at least some editions of the most-often used research methods texts, not only because of the present study, but also in light of the library's Course-Adopted eTextbook program (Carr, Cardin, & Shouse, 2016).

Future Research

The current study has both immediate and long-term implications for management of the library's collections. In the short term, collection managers can examine their investigation into whether highly-cited journals are individual subscriptions, available only to the university users within aggregators, or are part of journal packages. Collections librarians can also begin a dialogue with departmental faculty about the monographs selected and monograph formats.

Another area mentioned above that is beginning to receive more attention in citation analysis is the presence and uptake of open access articles compared to subscription access. Gasparotto (2014) brings this up in a limited fashion in her study of Spanish and Portuguese Department dissertations from Rutgers.

The current study did not include

Table 5: Journal Title Distribution by Number of Citations

Number of Journals	Uses Per Title	Total Citations	Percent of Citations
35	30X or more	1,986	32%
159	7X – 29X	2,101	34%
1,186	1X – 6X	2,122	34%
1,380		6,209	

consideration of open access titles except for journals not available through the library's E-Journal Portal. Although Joyner Library does provide access in its discovery services to Directory of Open Access Journals, Directory of Open Access Books, and other well-known OA providers, not all open access journals and books are tracked and discoverable using library systems. Collection management librarians face a decision point: when they become aware of OA titles that have been cited, should they add these titles to the library's catalog? Our approach of adding OA packages and only selectively adding individual titles is likely not unique, and the decision-making behind it will only become more important as more titles are available on an open access basis.

Another aspect of materials not offered through library discovery systems is the widespread and increasing availability of articles on social networks such as ResearchGate or Academia.edu. This availability likely has an influence on how students were accessing materials, but was beyond the scope of the current study. We cannot know whether the student used a copy of the article from ResearchGate or the library's collection; we can only know whether Joyner Library offers access to that particular journal volume. The same is true for articles that are available on authors' websites, in institutional repositories, or disciplinary repositories. Future research, then, might focus on how thesis and dissertation authors access content in order to gauge the impact of social networking sites.

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