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# Proving the Value of Library Collections

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# Proving the Value of Library Collections

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## Abstract

Proving the value of library collections has always been a concern of collection development librarians. Librarians have devised creative methods of gathering evidence to demonstrate to university administrations the essential role that libraries play in research productivity. In an attempt to demonstrate the value of library collections, the authors from the University of Kansas (KU) Libraries conducted a citation analysis study utilizing KU science faculty publications. Using a random sampling of faculty from the departments of Physics, Environmental and Evolutionary Biology, and Geology, the authors developed lists of the citations in these faculty publications and checked to determine if KU Libraries provides access to these cited materials. In addition, a random sampling of the citations from the faculty publications was also examined to determine if the citations could be accessed through aggregator full-text databases, electronic journal packages, or print journals and monographs. The authors also compared journal and monograph use and utilized the data collected as a method of justifying budget allocation practices. Finally, the monograph citations were analyzed to determine the effectiveness of the approval plan profile by identifying the ratio of books that were purchased on the approval plan compared to books that were selected by subject librarians. The authors will share their findings and discuss how they used the citation analysis to demonstrate the value of the library collections and inform collection development decisions.

## Introduction

Academic libraries are constantly compelled to prove their worth to university administrations. With large operating budgets, university libraries are regarded by administrators as major investments that can be trimmed and put to other uses. In all actuality, budgets are decreasing, reducing buying power dramatically. The objective of this study was to prove the value of the KU Libraries by demonstrating that the Libraries provide access to the necessary resources for faculty research. Through a citation analysis project, the authors randomly sampled faculty in three science departments (physics, ecology and evolutionary biology, and geology). They used a random sample of the citations from these publications to analyze library access and ownership. Using this analysis, the authors were able to demonstrate the role libraries play by providing essential resources in the research productivity of faculty. The authors assumed that science faculty primarily uses journals in their research. They also assumed science faculty use recently published books and journals. Along with

proving these assumptions, the authors sought answers to the following questions to inform collection management decisions:

- What formats (books, journals, etc.) are used by science faculty?
- Are the cited items available electronically, in print, or both?
- What is the age of the cited materials?
- How are the cited journals purchased? (In a large journal package, in an aggregator database, etc.).
- Are cited items available as openly accessible and freely available journals
- What are the most frequently cited journals in these disciplines?
- Do citation patterns vary among these science disciplines?
- Do current budget allocations adequately support the most frequently used formats?

## Methodology

To begin this analysis, the authors consulted with a statistician to develop a random sampling method. Using the list of faculty on the departmental websites, the authors chose every fifth faculty member to include in the analysis. Student assistants downloaded the faculty's CVs and copied and pasted the list of citations in each of their publications into a spreadsheet. Only faculty publications from 2005 to present were included. The students searched each citation and indicated in the spreadsheet if the item was available to the researchers and, if so, in print or electronic format or both. In all, they looked up 5,658 citations in physics, 3,883 citations for ecology and evolutionary biology, and 2,843 citations in geology for a total of 12,394 citations, confirming that scientists use a large number of resources.

From the original list of citations, the authors chose every 20<sup>th</sup> citation to use in a more detailed analysis. If the journal articles were available electronically, the journals were further

available through department websites may not be up-to-date or complete. This could skew the results because analyzing older publications may not reflect the current research patterns of faculty. The authors also found mistakes with the searches that the students had performed and concluded that the Libraries actually owned more of the resources than reported by the students.

## Analysis

A total random sampling of 551 citations was further analyzed (See Table 1); 438 or 79% of citations were from journals. Only 42 or 8% of the citations were from books. There were 71 or 13% citations categorized as "other," which included conference proceedings, dissertations and theses, and research reports. The average publication date for all formats was 1994. The total number of citations with no KU access was 112 or 26%. Only 14 citations or 3% were available in openly accessible.

	Physics	Geology	EEB	Total
Total Citations	278	89	184	551
Average Publication Date	2000	1989	1992	1994
Total Journal Citations	225	74	139	438
Total Book Citations	12	6	24	42
Total Other Citations	41	9	21	71

Table 1. Citation Results Summary

categorized as accessible through a journal package, an aggregator database, or openly accessible and freely available on the Internet. Each book that was identified was searched in the library catalog and in YBP's portal to determine if the library owned it and if each was received through the approval plan or selected by subject librarians. Electronic access was also noted for books.

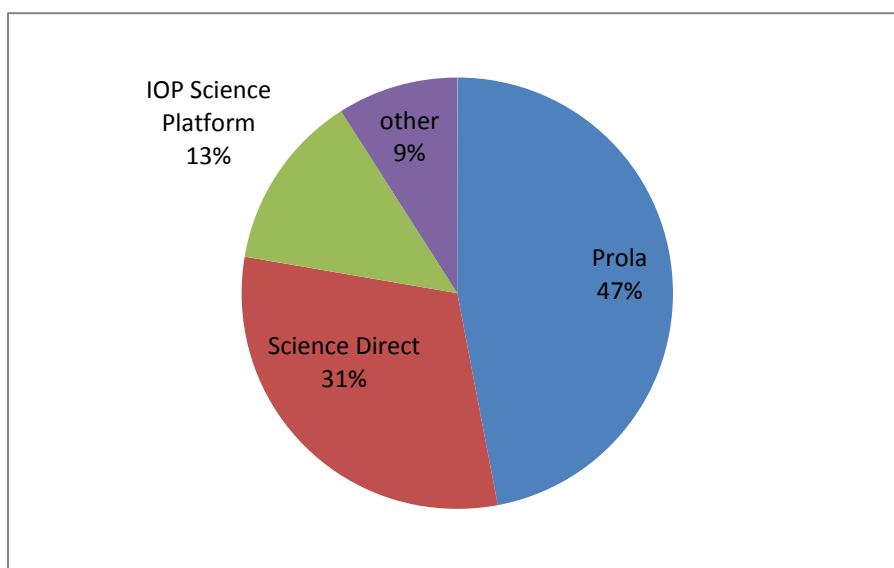
With any citation analysis project, there are limitations. One of the problems the authors faced during the project was the currency of the CV of each faculty member. The CVs publically

## Physics

From the 278 citations that were analyzed for physics, 225 or 81% were journal citations (See Table 2). Out of those journal citations, the KU Libraries has access to 95% of them in print and/or electronic format. Eighty-three percent were available electronically, and 57% were in print format. One hundred and three journals or 46% were duplicated in print and electronic formats. Seventy-eight and one half percent of the journals were available through a subscription to a journal package. Of those 176 titles available in journal packages, 151 or 85.5% titles came from

% of Total Physics Citations	85%
Average Journal Publication Date	2001
Median Journal Publication Date	2004
Total Citations with Print or Electronic Coverage	214
% Citations with Print or Electronic Coverage	95%
Total Citation with Electronic Coverage Only	188
% of Journal Citations with Electronic Coverage	84%
Total Citations with Print Only Coverage	26
% of Total Citations with Print Only Coverage	11%
Total Journal Citations with Electronic & Print Coverage	103
% of Journal Citations with Electronic & Print Coverage	46%

**Table 2. Physics Journal Citations**



**Figure 1. Physics Journal Package Coverage**

Total Physics Book Citations	12
% of Total Physics Citations	4%
Average Book Publication	1996
Median Publication Date	1993
% of Book Citations Held at KU	17%
Electronic Coverage	0

**Table 3. Physics Book Citations**

three packages, IOP Science, PROLA, and Science Direct (See Figure 1). Only 21 journal titles or 9.3% were accessible through aggregator databases, and 11 of those titles were available in Academic Search Complete. The average publication date of the articles cited by physics faculty was 2000, while the median publication date was 2004. In physics, only 59 books were part of the sample, and the other 29 items consisted of conference

proceedings, dissertations, and theses (See Table 3). The average publication date of the cited books was 1990, with the oldest items being published in 1934. Seventeen percent of the books were owned by KU. Only one of the titles had arrived on approval. Out of the 278 citations analyzed for physics, the library did not provide access to 41 titles or 15% of the citations.

## Geology

A total of 89 citations were analyzed for Geology. Of those 89, 83% were journal citations (See Table 4). KU Libraries has print and/or electronic access to 70% of those journal titles, with 81% available electronically, 48% also having duplicate print coverage, and 15% available in print only. The average year of publication for the journals cited by geology faculty was 1988, and the median date of publication was 1997. The oldest journal citation was 1854. Sixty-one percent or 45 of the journal citations were available through a journal package, primarily from GeoScience World and Wiley-Blackwell (See Figure 2). Only five journals or 7% of the journal citations were found in

aggregator databases, and all five of the titles in geology were found in Academic Search Complete.

Books were a very small percentage of the total citations in geology (See Table 5). Only six titles were books, and the KU Libraries provided access to only three of those titles. The average publication date for the books was 2000 and none of them had come on approval. The remaining citations were comprised of conference proceedings, dissertations and theses, and research reports.

Out of the 89 Geology citations, there was no access to 27 items.

% of Total Geology Citations	83%
Average Journal Publication Date	1988
Median Journal Publication Date	1997
Total Citations with Print or Electronic Coverage	52
% Citations with Print or Electronic Coverage	70%
Total Citation with Electronic Coverage Only	6
% of Journal Citations with Electronic Coverage	8%
Total Citations with Print Only Coverage	11
% of Total Citations with Print Only Coverage	15%
Total Journal Citations with Electronic & Print Coverage	35
% of Journal Citations with Electronic & Print Coverage	48%

Table 4. Geology Journal Citations

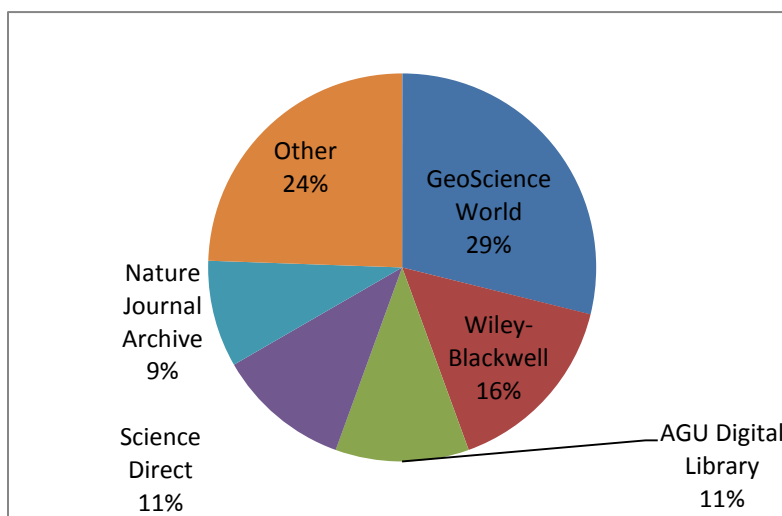


Figure 2. Geology Journal Package Coverage

Total Geology Book Citations	6
% of Total Geology Citations	7%
Average Book Publication Date	2000
Median Publication Date	1999
% of Book Citations Held at KU	50%
Electronic Coverage	0

**Table 5. Geology Book Citations**

### Ecology and Evolutionary Biology (EEB)

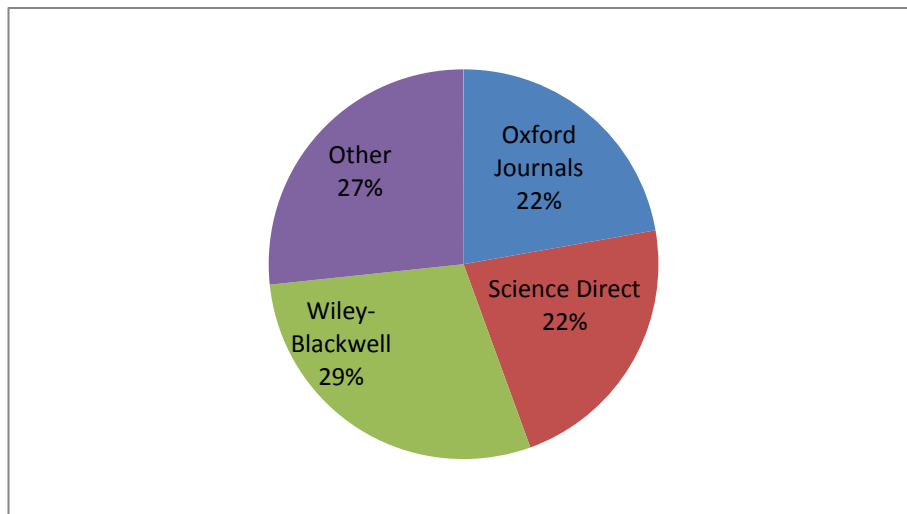
One hundred and eighty-four citations were analyzed for ecology and evolutionary biology. Of those titles, 139 or 76% were journals (See Table 6). The KU Libraries provides access to 114 or 82% of those titles in print and/or electronic access. The average publication date for all the journal citations in EEB was 1994, and the median publication date was 2002. The oldest item was

published in 1887. Thirty-two percent of the journal titles are available through journal packages, and 14% of the journal citations have electronic access through aggregator databases (See Figure 3). It is interesting to note that seven of the citations in aggregators are also accessible through journal packages.

KU owned 54% of the books that were used by EEB faculty (See Table 7).

% of Total EEB Citations	76%
Average Journal Publication Date	1994
Median Journal Publication Date	2002
Total Citations with Print or Electronic Coverage	114
% Citations with Print or Electronic Coverage	82%
Total Citation with Electronic Coverage Only	27
% of Journal Citations with Electronic Coverage	19%
Total Citations with Print Only Coverage	29
% of Total Citations with Print Only Coverage	21%
Total Journal Citations with Electronic & Print Coverage	58
% of Journal Citations with Electronic & Print Coverage	42%

**Table 6. EEB Journal Citations**



**Figure 3. EEB Journal Package Access**

Total EEB Book Citations	24
% of Total EEB Citations	13%
Average Book Publication Date	1986
Median Publication Date	2000
% of Book Citations Held at KU	54%
Electronic Coverage	1

**Table 7. EEB Book Citations**

## Discussion and Conclusion

The original assumption that science faculty use more journals than books was substantiated. Eighty-one percent of the citations were journals. The authors were also gratified to learn that KU Libraries provided access to 73% of the overall citations. Of the journal used, 87% had print or electronic coverage at KU. Fifty percent of the journals were available only in electronic format, while 15% were available in print only coverage. Forty-five percent of the titles overlapped in print and electronic format, which is due to many publishers requiring libraries to subscribe to the print in order to maintain access to the electronic format.

The average journal publication citation date of 1994 was a little surprising, but after talking to science librarians, this date is probably appropriate for EEB and Geology. Scientists in EEB and Geology are known to cite classic works that were written on the foundations of evolutionary theory and paleontology. The average publication date for physics is 2001, which is also expected.

Journal packages seem adequately cover some of the disciplines. Of the journals in physics, 79% were covered by journal packages, while only 32% of the EEB titles were in packages. This could account for the reason that the budget for individual subscriptions for EEB journals is about four times as high as the budget for physics journal subscriptions and about three times larger than the geology budget, which had 61% coverage by journal packages. Fewer journals were covered by aggregators, only 9.3% in physics, 7% in geology, and 14% in EEB. More than half of the journals in aggregators were available in the same single aggregator (Academic Search Complete), and more than half of the journals found in this aggregator were also available in large journal

packages. This particular aggregator has obviously been successful in negotiating with several of the large science publishers. Only 14 titles or 3% were openly accessible and freely available on the Internet. Ten of those titles were in EEB publications, and four were in geology publications.

Physics was the only discipline in this study with a significant number of highly cited journals. The top journal in physics was cited 42 times, while the top titles in EEB and Geology were only cited 8 times. KU owns all of the top-cited journals from the list and provides both print and electronic access to all but one of the titles. Citation patterns among the three disciplines do not vary significantly, with the exception of electronic coverage of journals. Eighty-four percent of the physics journals were covered electronically, while only 8% of the geology titles and 19% of the EEB titles had electronic access. The other area that varied was the percentage of book titles owned by KU. Geology and EEB had 50% and 54% respectively, while KU only covered 17% of the physics titles.

Based on the current allocations for books versus journals, 5% of the budget for geology is spent on books, while 15% of the physics budget is spent on books, and only 2% of the budget for EEB is spent on books. Since only 46% of the books the faculty in physics used for their research were owned by KU, these figures may be a good reason to increase the book budget in this discipline. Overall, the budget allocations seem to match the use of books versus journals fairly well.

On the whole, the authors concluded that KU Libraries does a better than adequate job of supporting researchers in these disciplines. Some slight adjustments to the budget allocations may be needed, but the evidence collected in this

study points mostly to the fact that the KU Libraries have supported their disciplines quite well. Future studies are being planned to collect data from disciplines in the social sciences and humanities. A comparison of this data to the data

already collected in the sciences will hopefully provide even more evidence that the KU Libraries supports the researchers at the University of Kansas and will need to maintain its current level of funding to continue to do so.