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### Is “Just Googling It” Good Enough for First-Year Students?

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# Is “Just Googling It” Good Enough for First-Year Students?

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**ABSTRACT:** This study analyzes citations by first-year students to determine what content they were citing and whether it was available through the open web or the library. Examining the role of these two places as content providers for academic work fills a gap in the literature. Most of the cited works were available through the library and the open web. As the line between content providers continues to blur, these results can help academic libraries prioritize what to teach students about information literacy, where to focus collection development efforts and how to promote the discovery of library resources.

**Keywords:** Citation analysis, first-year students, information literacy, open web, open access

## **Introduction**

Academic librarians often use library instruction sessions, whether bibliographic or more broadly focused on information literacy concepts, to persuade students of the need for and benefits of using library curated resources for academic research. As indicated by a recent survey of instruction practices in academic libraries in the United States, an emphasis is put on the online databases and other resources offered by the library that are not freely available on the open web (Julien, Gross and Latham 2018).

First-year students typically arrive at college thinking they are already “experts” at doing research based on their lifetime of experience on the open web using search engines like Google (Georgas 2014). As Raven (2012) learned from survey results, most incoming students even

expect Google to fulfill 50% to 100% of their research needs. Nevertheless, studies consistently show that most students have little understanding of what *is* available on the open web, how to find and evaluate resources for college level research, or how open web search works (Georgas 2014). And, as Šorgo, Bartol, Dolničar and Podgornik (2017) demonstrated, digital native status is a poor predictor of the information literacy skills of university students. Even the head of Search Quality and User Happiness at Google believes that most internet users lack a basic understanding of how search works (Russell 2019). If the “Google-centric search skills that freshmen bring from high school only get them so far” (Head 2013, 1), is it because they do not know how to effectively search the open web or because the open web does not provide access to the resources they need?

The tension between librarians and students on where, and how to find resources, and even what types of resources are acceptable for academic work, continues to evolve. Because of the efforts of librarians in promoting open access journal publishing, open educational resources and institutional repositories, the volume of academic resources available on the open web continues to increase (ACRL Research Planning and Review Committee 2016). In addition, most news articles, including news offered by legacy news providers through a subscription or the library, are now available for free, at least selectively, on the open web (Williams 2016).

Recognizing the appeal and valuable content available on the open web, libraries are increasingly adopting web-scale discovery systems that allow their patrons to access both the library’s subscription-based databases and selected open web content through a single search box (Deodato 2015). Some libraries are even acknowledging the value of the open web as a discovery tool by promoting the use of browser plug-ins such as Kopernio and Lean Library that bring library content to users while browsing the open web (Tay 2019). However, simply

providing more information from the open web or through the library, does not make students more information literate. It just adds to the complexities. The ACRL recognized this when it moved away from a skills-based approach to information literacy to the concept-based approach embodied in the *Framework for Information Literacy for Higher Education* (Association of College and Research Libraries 2016). Implicit in this new approach was an acknowledgment of the value offered by the many forms, voices and platforms that comprise the entire information ecosystem, not just the scholarly literature that has become a mainstay of academic library collections. Rather than simply favoring one content type or provider over another, the new framework asks that we think more critically about the value, sources and formats of all of the different types of information now available.

In this study, the citations of first-year students on poster sessions were examined to discover what type of sources they were using to support their work. These citations were then examined to determine where these students found or could have found this content. The first hypothesis was that their information ecosystem would be comprised of the open web and library resources. The second was that most of their citations would be to non-academic sources found on the open web and that any citations to scholarly journals or books (including reference materials) would be to content provided by the library.

The first hypothesis turned out to be correct, that is, students were citing non-scholarly sources on the open web more often than any other single type of content. However, the second turned out to be wrong. These first-year students were also citing scholarly works, and more than half of these works were also available to them through the open web.

## **Literature Review**

Citations have been analyzed for decades and for a variety of purposes. Initially, citations were studied to evaluate the importance of a journal by attributing value based on the number of times it was cited (Garfield 1972). Then they were used to evaluate whether the library's collections were meeting the needs of its users—especially its advanced students or researchers—the audience with the most interest and at stake in research (see, e.g., Beile, Boote and Killingsworth 2004). However, as use of the internet and electronic resources increased, the number of studies analyzing citations by undergraduates, including first-year students, increased. The purpose of most of these undergraduate studies was to assess whether undergraduates were using the library's academic resources and if not, how information literacy instruction efforts could be modified to lead students back to the scholarly sources offered by the library and away from the open web.

The longitudinal studies by Davis and Cohen set the stage for the study of citations by undergraduate students (Davis and Cohen 2000; Davis 2002, 2003). These researchers studied the citations in freshman term papers submitted between 1996 through 2001, the period when student access to both the open web and electronic journal content was just taking hold. Their goal was to learn more about how online content was influencing the content used to support academic work.

As one might expect, in the initial period from 1996 through 1999, the number of citations to scholarly sources, defined as book and journal citations, including the library's proprietary journals that were now available electronically, decreased and citations to non-scholarly sources on the open web, defined as newspaper and web citations, increased (Davis and Cohen 2001). In later years—presumably because professors set clearer expectations about the types of sources that were acceptable—the number of citations to scholarly articles, after

decreasing in 1997 through 1999, returned to 1996 levels. However, use of the open web for research had clearly taken hold and the number of citations to non-scholarly web sources continued to increase (Davis 2003).

The Ursin and Johnson (2004) study of the final project bibliographies of first year students confirmed this behavior. Their goal was to assess the impact of library instruction, which included providing students with library resource guides created for their projects, on the selection of different content types. Despite efforts to direct students to the library's resources, students primarily relied on non-scholarly web sites—many of which were problematic due to quality issues, unstable URLs or both—using the library guide less than 10% of the time.

The study by Carlson (2006) also examined undergraduate citations by content type. However, instead of evaluating the impact of library instruction, he looked at the impact class level, academic discipline or course level had on citation behavior. Carlson found that all three variables had a significant impact but because the variables were interrelated, he was not able to determine the impact by variable. However, he was able to discern that even though books and journal articles comprised a majority of all works cited, citations to web sites was a constant across all class levels, accounting on average for 17% of all citations.

The citation analysis by Knight-Davis and Sung (2008) showed similar results. These researchers examined the citations found in writing samples of undergraduates from four periods. They classified each citation by content type as an indicator of the value of a source. Next, as a way of evaluating whether the library's collections met user needs, especially when the library was providing more scholarly journal content electronically, they looked at whether the cited sources were the print or electronic resources available through the library. Although print books were the most cited type of resource, citations to

the web, defined as electronic documents that were not e-books, e-journals, newspapers or government documents, were the second most frequently cited type of content followed closely by electronic journals. This study showed that users were increasingly relying on electronic or online content whether it was from the open web or the electronic journals provided through the library's subscription databases.

The study of citations in honor students' theses by Kriebel and Lapham (2008) as well as the studies of citations in dissertations of graduate students by Conkling, Harwell, McCallips, Nyana and Osif (2010) and by Wu and Chen (2012), showed another dimension of this increasing tendency to rely on online sources. Although each of these studies of more advanced students found that scholarly sources played a greater role in research as students moved up in course level, they also found that non-scholarly open web content was increasingly being used to support academic work.

The study by Lantz et al. (2016) of the final bibliographies of students in a first-year composition class is also instructive. These researchers compared the annotated bibliographies due in week 5 of a course (2 weeks after they received one-shot library instruction sessions), to the final bibliographies they turned in at the end of the semester with their paper (12 weeks after the instruction sessions). Their purpose was to assess the impact lapse of time following a library instruction session had on the type of content cited.

Despite structured library classes that emphasized using library databases and scholarly works, the number of citations to websites increased more than any other category (Lantz et al. 2016). In the first assignment websites accounted for only 3% of all citations but in the final assignment they accounted for 16%, representing a 524% increase. The authors recognized this increase might be explained by the studies that show students use more library sources

immediately after a library session. However, they also posited that it might be because students were electing to use the open web because in the end they were able to synthesize non-scholarly works more effectively, suggesting it might be time to reexamine pedagogical assumptions that favor different types of content over others. The problems with categorically emphasizing the importance of scholarly versus non-scholarly sources is supported by the work of Rosenblatt (2010) and Carlozzi (2018) who separately found that undergraduates don't have problems finding scholarly literature, but once they did, they did not know how to synthesize them. It is also supported by the work of MacMillan and Rosenblatt (2015) who suggest that requiring students to use a prescribed number of scholarly articles is part of the problem. They argue that especially for lower-level students, the focus should be on using appropriate sources—maybe books, reference works and even open web materials—that provide an overview of a topic.

The above studies establish that open web content has found its place in the mix of the types of content relied upon for academic work. What is less clear, is how much of the content being cited that falls within the traditional purview of libraries, is also freely available on the open web. In other words, what impact has the open access journal movement, the open educational resources movement, the promotion of open institutional repositories and academic social networking sites, and the practices at news providers to make at least some amount of content available on the open web for free, had on the utility of the open web as a provider.

The study by Grigas, Juzeniene and Velickaite (2017), which analyzed the citations used by PhD students, answers this question. This study examined the role the library was playing as an intermediary between users and information sources, by determining whether the works cited by these PhD students could have been found at no cost (and therefore without the library acting as an intermediary) on the open web.



The findings showed a majority of the citations were to scholarly sources (about 50% to peer reviewed journal articles and 30% to books or e-books), and most (80%) could be found through the library's holdings or subscription databases. However, the findings also showed that more than half (57%) of all citations were also available for free through the open web. This was attributed to the explosive growth in Google Scholar for finding open access journal articles, the increased availability of articles deposited in institutional repositories and on academic social networking sites, and the utility of using Google to find grey literature, such as pre and post-prints, conference proceedings and working papers. Unlike earlier studies that correlated content on the open web to non-scholarly content, this no longer seemed to be the case. It was possible that even PHD students were getting closer to being able to “just google it” to get their information needs met.

To date, no comparable study has been found that looks at the impact the open web has had as a content provider—across the different content types—on the resources cited by undergraduate students. This study fills that gap and does so through the lens of the citations of first-year students, the group of undergraduates most likely to think the open web is the only source you need for conducting research. The research question it answers is whether “just googling it” can lead first-year students to the same mix of content they would have found by using the library.

### **Institutional Setting**

This study took place at John Jay College of Criminal Justice, one of the senior colleges within the City University of New York (CUNY). It promotes a justice-oriented curriculum across the arts, sciences and humanities, that help students pursue meaningful careers in the private, public

and not for profit sectors (John Jay College 2020). It is nationally recognized among colleges in the United States for its diversity and student mobility index, which measures the percentage of students from low income families that move into the middle class (City University 2018). Its library aims to teach students how to navigate in a complex information environment and access resources that facilitate lifelong learning (Lloyd Sealy Library 2020).

The library website is the gateway to its resources. The library's home page uses as its default search a discovery tool that uses a single box that searches across most library resources and selected open web resources—including selected open access journal articles, open educational resources, government documents and institutional repositories—in one search. It also has links to over 200 multi-disciplinary or specialized databases, most of which are subscription based but some of which are freely available on the open web. The library at John Jay College offers various programs and tools to support information literacy efforts including one-shot library classes, individual consultations at the reference desk or by arrangement, print handouts, online guides, library workshops, and online tutorials.

As part of its focus on initiatives that support student success, John Jay College has been sponsoring first-year poster sessions since 2015. These posters sessions celebrate student research and creativity by involving students in the research process early in their academic careers, which includes learning how to use primary and secondary sources.

## **Methodology**

The citations analyzed in this study are from the 39 posters included in the December 2016 student showcase of first-year research. The office of Student Academic Success Programs

sponsored the event and provided the author with a list of the citations. These posters were prepared by about 200 students in introductory courses in a variety of disciplines including Africana studies, anthropology, communications, English, Latin American and Latinx studies, and philosophy. The posters covered a range of topics that related to these different disciplines.

The poster session guidelines required that each poster include references that followed the citation format appropriate for the respective class or discipline ([institution name]).

Although it is likely that course instructors played some role in selecting citations, and approved the posters included in the showcase, they were not contacted for any purpose in connection with this study. In addition, less than one-third of the classes that prepared posters attended a one-shot library instruction session. These sessions were a blend of bibliographic and information literacy instruction, based on the discretion of the instructor. Typically, they would include an overview of library materials and services, the differences between scholarly and non-scholarly sources, how to use library databases and tips for discovering appropriate sources on the open web. The reference sections of these posters were examples of authentic student work, reflecting their cumulative skills and knowledge, and serve as a useful tool for assessing where these students were on the information literacy spectrum (Carbery and Leahy 2015).

Each citation was placed into one of these categories: scholarly articles, monographs, reference works, news articles, and miscellaneous web content. If a citation included a URL, the URL was used to search for the cited work. If no URL was provided or if one was provided and it led to content provided by the library or the open web, the title of the resource was used to also search for the content on the open web by using Google Scholar or a basic Google search or to search for the content through the library. The primary goal was to determine whether each cited

work was available through the library and the open web, regardless of where the student may have found the work. No advanced strategies, such as searching by keywords or subject, or employing browser plug-ins or extensions to discover content, were used to find the cited resources somewhere on the open web or in the library's collections.

The library searches were conducted by using OneSearch (the name used by the library to describe its discovery tool) beginning in 2017 through 2019. If the content was not found by searching for the content by title using OneSearch, the library catalog or a library database was searched based on content type, or if the journal name was known, by searching for an article at the journal title level. These searches were ongoing and were not used to assess the permanence of any URL but to provide a snapshot of where content was available at the time of the search.

If a cited resource was available through the library and through the open web and a URL was provided by the student, it was noted whether the student accessed the resource through the open web or the library. This was done by looking for the name of the library or the name of one of the library's subscription-based databases in the URL and if neither were present, by confirming that the URL linked directly to open web content. If there was no URL and the resource was available through the library and the open web, the access point for the content was unknown. The domain suffix (.org, .edu, .gov, .com, and others), was noted for any content available on the open web.

### ***Scholarly articles***

A citation was categorized as a scholarly article based on its characterization as having been published in a scholarly journal by the library's discovery tool, the publisher's website, or Ulrich's Web, which has bibliographic and publisher information for academic and scholarly

journals. Most of the scholarly articles were peer reviewed. Law school journal articles and dissertations were also included as scholarly articles even though not subject to the peer review process.

Searches for scholarly articles were conducted on the library's website *and* on the open web starting with Google Scholar. The feature in Google Scholar for viewing all versions of an article was used to ascertain whether and where the full text of an article could be accessed on the open web. The number of scholarly articles included those freely accessible on specialized academic social networking sites like researchgate.net and academia.edu, if the user only had to create a free account for access. For every scholarly article found on the open web, Ulrich's Web or the publisher's website were searched to learn whether the entire journal was freely accessible on the open web, or just the cited article.

### ***Monographs and reference works***

Citations to monographs and reference works were searched for by title on the library website and on the open web. Reference works included encyclopedias, dictionaries, statistics, research reports and any other content that was only available through the library that did not fit into the other categories. Multiple citations to the same resource were not eliminated so the numbers included reflect the number of times a type of content was cited by different students on each poster. In two instances, the citation was to a chapter in a book. Even if only a chapter was available on the open web, it was counted as a monograph.

### ***News articles***

News content, which included newspaper and magazine articles, were searched for by title on the open web and the library website. The news providers included legacy news organizations, meaning pre-web newspapers, magazines or news broadcasting organizations such as the New

York Times, Time Magazine, and CNN, as well as any digital native news organizations, meaning news organizations that published online from the beginning such as the Huffington Post. If a news article was not found by using OneSearch (the library's discovery tool), the library's journal finder tool was used to determine whether the library provided access to such publication. If the library did provide access to the publication, another search was conducted for the article at the journal title level.

An effort was made to search a publisher's website to determine whether an entire newspaper or popular journal was freely available online or whether limited access was provided based on some criteria—such as number of articles viewed—before a user would have to pay for a subscription.

### ***Miscellaneous web content***

Content from the open web that did not fall into the other categories were classified as miscellaneous web content (called websites in the tables and figures in this study). This category covered a wide range of content provided by commercial, media, government and not-for-profit organizations. By design, items in this category only included content available on the open web and not through the library.

## **Results**

### ***Content Available Through the Library and the Open Web***

552 citations were analyzed. As set forth in Table 1, the largest single category of content was to miscellaneous websites, closely followed by scholarly articles, and then news articles, monographs and reference works. Most of the content could be found on the open web (70% or

388 of 552), but the library also provided access to a majority (57% or 317 of 552) of the cited works. By content type, most of the scholarly articles were available through both the open web (53% of 89 of 166) and the library (99% or 164 of 166). Similarly, most of the news articles were available through both the open web (93% or 89 of 96) and through the library (59% or 57 of 96). Only the library provided access to most monographs (88% or 57 of 65) and reference works (62% or 23 of 37). Excluding the miscellaneous websites, 90% or 317 of 364 of the cited works were available through the library and still a majority, 54% or 200 of 364, could also be found on the open web.

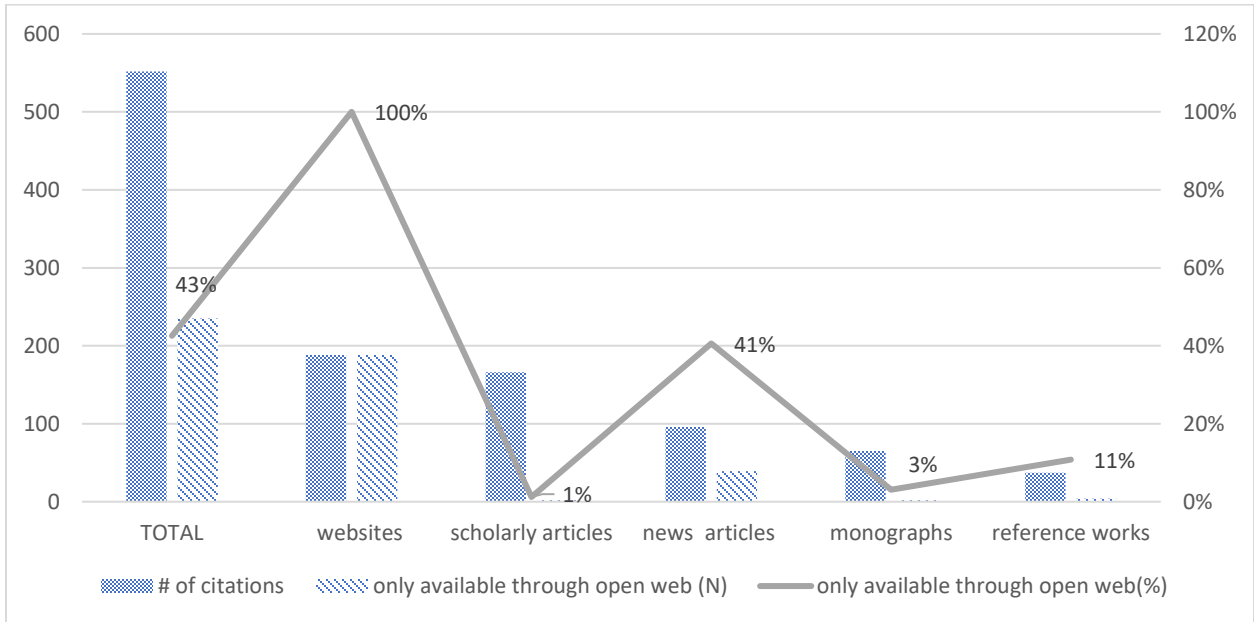
**Table 1** Summary of all citations by content type and availability.

content type	# of citations	available on open web	available through library	only available through library	only available through the open web
websites	188	188	0	0	188
scholarly articles	166	89	164	77	2
news articles	96	89	57	7	39
monographs	65	8	63	57	2
reference works	37	14	33	23	4
TOTAL	552	388	317	164	235

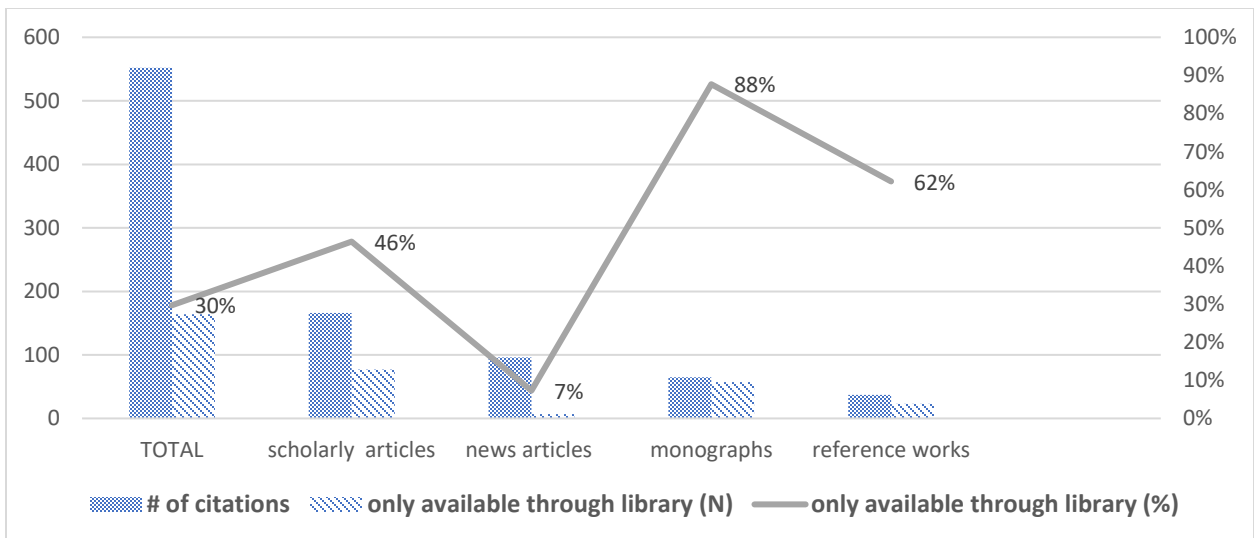
***Content Only Available Through the Open Web or Only Available Through the Library***

As illustrated by Figures 1 and 2, 43% or 235 of the 552 cited works, were *only* available on the open web, compared to 30% or 164 of 552, which were *only* available through the library. By content type, the open web was the only source for 41% of the news content and was also the only source for the miscellaneous website content. In contrast, the library played a significant

role as the provider of scholarly articles, monographs and reference works, by being the only source for 46%, 88% and 62%, respectively, of this content.



**Figure 1** Content only available through the open web.



**Figure 2** Content only available through the library.



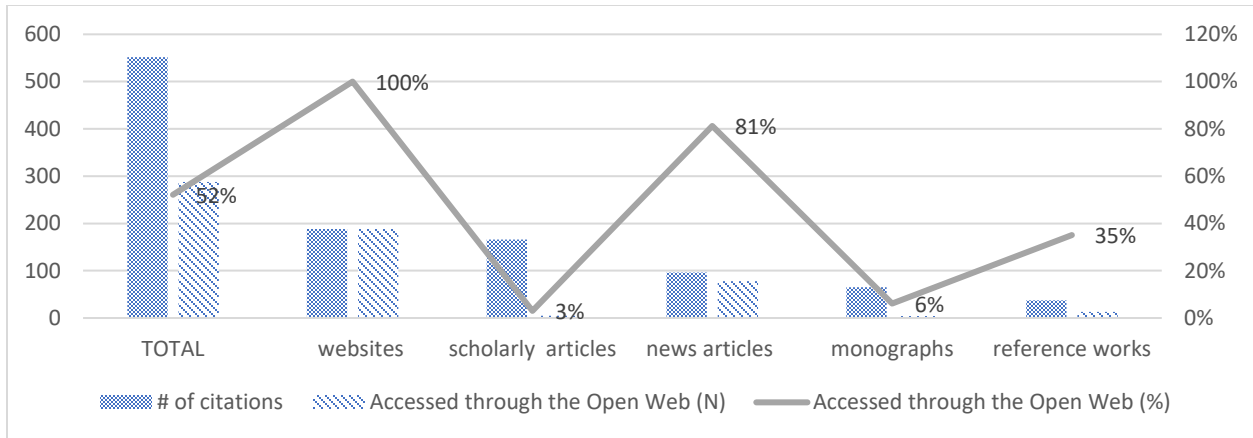
### *Access Points by Content Type*

The open web was the access point or content provider for most (52% or 288 of 552) of the citations (see Table 2). If you exclude the miscellaneous websites and the 87 citations for which the content provider was unknown, the library was the access point or content provider for most (64% or 177 of 277) of the cited content.

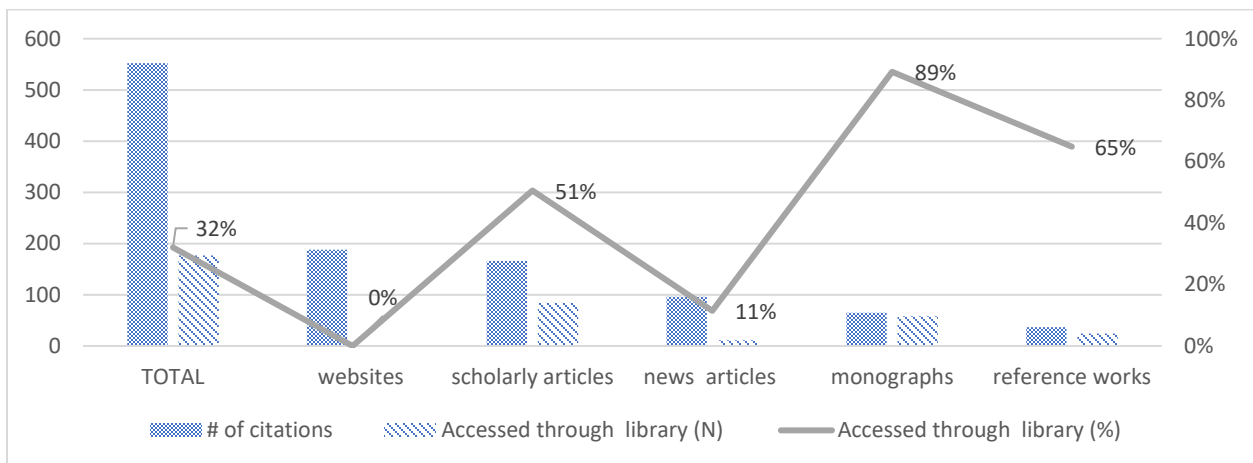
**Table 2** Summary of content by access point.

content type	# of citations	Accessed through the open web	Accessed through the library	Access point unknown
websites	188	188	0	0
scholarly articles	166	5	84	77
news articles	96	78	11	7
monographs	65	4	58	3
reference works	37	13	24	0
TOTAL	552	288	177	87

The access point varied by content type. Most news articles were accessed through the open web (see Figure 3). Most monographs, reference works and scholarly articles were accessed through the library (see Figure 4). The access point for the vast majority (84% or 465 of 552) of the citations was determinable and most of the content (89% or 77 of 87) for which the access point was unknown, were scholarly articles (see Table 2).



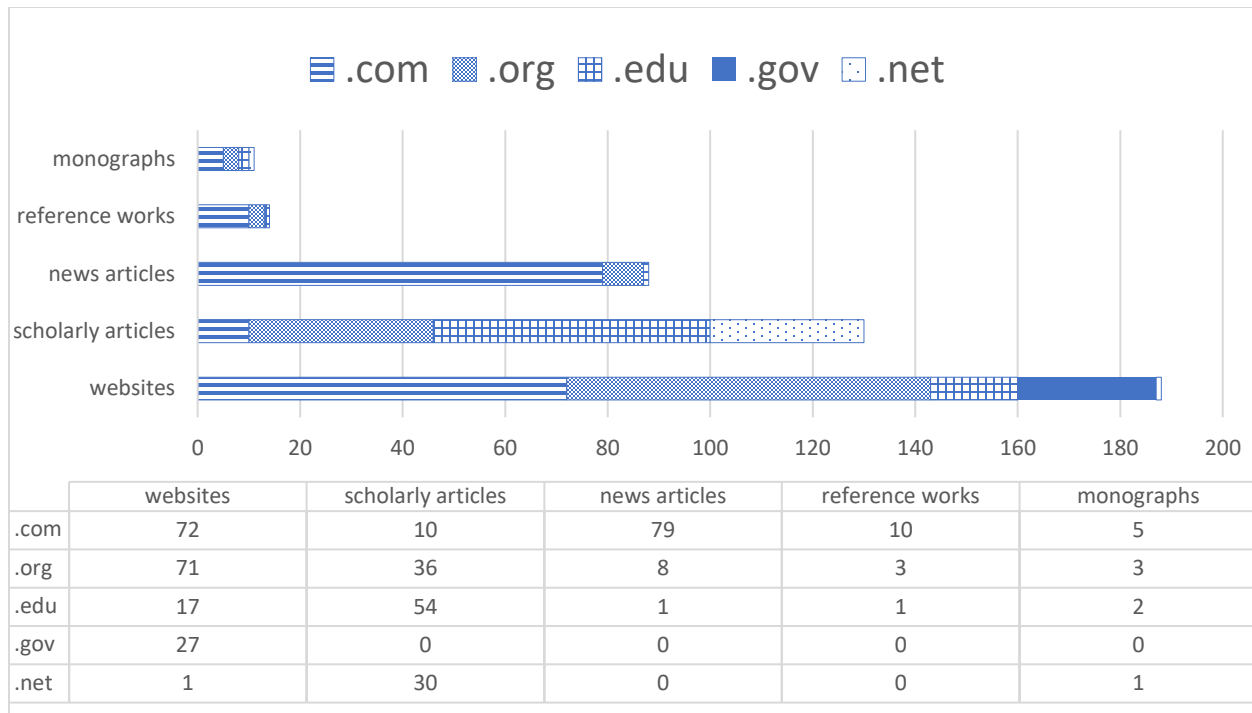
**Figure 3** Content accessed through the open web.



**Figure 4** Content accessed through the library.

### *Citations on Open Web by Domain Name*

In Table 1, 74% or 388 of the 552 cited works was to content available on the open web. No single domain name dominated but the largest source for these works was .com websites, followed by .org, .edu, .net and then .gov websites (see Figure 5). The relative significance of a domain varied by content type.



**Figure 5** Domain names of open web content.

Out of the 188 citations to miscellaneous websites, 39% were to .com sites, closely followed by .org sites at 38%, and then .gov sites at 14%, .edu sites at 9% and 1 to a .net site (Figure 5). The publishers of these sites were broadly dispersed other than for 20% of these citations which were to materials provided by history.com, biography.com, and livescience.com.

The 89 scholarly articles accessible on the open web, were found on 130 websites because several articles were available in more than one place. Most of these articles, 60%, were available on .edu sites, followed by .org sites at 40%, .net sites at 33% and the .com sites of publishers at 9% (see Figure 5). In addition, over 75%, or 23 of 30, of the scholarly articles available on .net sites, were to the academic social networking website Research Gate, which has been involved with several disputes with publishers about its rights to share content (McKenzie, 2018). Whether there were any disputes related to the right to share these cited articles was beyond the scope of this study.

Twenty percent, or 18 of these 89 scholarly articles, were published in journals freely available on the open web in their entirety, referred to as gold open access journals (Suber 2012). Eleven of these 18 gold open access journals were in law journals hosted on the law schools .edu site and the remaining 7 were hosted by various other .edu, .gov and .org websites. None of the gold access journals were found on the .com sites of commercial publishers.

All, 90% or 79 of 88, of the open web news articles were on .com websites (see Figure 5). Fewer than 10% of these news articles were available on .org websites and only 1, a student newspaper, was available on an .edu website. The New York Times was the most frequently cited news publication, representing 34% (33) of all news citations. The other news citations were widely dispersed across many publishers, including some from historical news archives, and usually were cited only once.

Fourteen reference works and 10 monographs were available on the open web and of that total, about 63% could be accessed on .com or .net sites, followed by .org sites at 25%, and .edu sites at 12%. As shown in Table 3, a variety of publishers supplied access to this content. Two of these websites, CQ Researcher and Statista, that provide content to libraries by subscription, only provide limited content for free on the open web.

**Table 3** List of websites providing open web access to reference works and monographs.

Reference works	Monographs
britannica.com	archive.org
statista.com	columbia.edu
cqresearcher.com	feministradicales.org
dictionary.cambridge.org	googlebooks.com
dictionary.com	historyisaweapon.com
encyclopedia.com	repec.org
pbs.org	researchgate.net
plato.stanford.edu	unc.edu

## **Discussion**

Based on the content cited, “just googling it” or relying on content available on the open web, appears to be good enough, to meet the information needs of first-year students. The open web provided the content for over 70% or 388 of all 552 citations, and even after excluding the citations to miscellaneous websites, still provided access to a majority (55% or 200 out of 364 items) of all cited sources (see Table 1). This open web content included a mix of scholarly and non-scholarly materials, overlapping with the content provided by the library about half of the time (other than in the case of monographs and reference works, for which the library was the principle content provider).

## **Websites**

Miscellaneous websites were cited more often than any other single category of content, representing 34% or 188 of the 552 citations (see Table 1). For this category of content, the question is not whether “just googling it” is good enough but whether students were citing quality information. Although confirming the quality of each work or its relevance to the research undertaken was beyond the scope of this study, course instructors gave tacit approval to both the quality and relevance of these citations by allowing them to appear on the posters in the showcase. Using the type of content, domain names and website names identified as part of this study as rough indicators of value is consistent with such approval. This was recognized by Schwieder (2016) in his toolkit of low effort search strategies, in which he recommends the use of domain name limiters to increase the likelihood of discovering appropriate sources on the open web.

A majority (62% or 116 of 188) of the citations to miscellaneous websites were to .org, .gov, and .edu sites so, based on the mix of domains cited, these first-year students were at least in the right realm for finding quality sources (see Figure 5). In addition, an examination of the names of the .com sites indicates that students were often using quality information on their topic. For example, about 20% of the .com citations were to material on history.com, biography.com, and livescience.com, which offer educational (even if entertaining) information. As suggested by the study by Lantz, Insua, Armstrong and Pho (2016) of first-year students, these students may have gravitated toward these non-scholarly web sources because they were easier to synthesize.

### ***Scholarly articles***

The second most frequently cited type of content was scholarly articles, representing 30% or 166 of the 552 citations (see Table 1). There was insufficient information to determine where these students accessed 46% or 77 out of the 166 scholarly articles (see Table 2), a body of literature that has historically sat behind paywalls. However, a little more than half of them were available on the open web and could have been found by “just googling it”. The library was the source for all but 5 of the scholarly articles for which the access point was known (see Table 2), making it unclear whether these students knew how to find this content on the open web. Considering the recent study by Schultz, Azadbakht, Bull, Bucy and Floyd (2019) documenting the effectiveness of Google Scholar as a tool for finding open access scholarly journal articles, this is an especially important skill for anyone relying on the open web for advanced research.

As shown in Figure 5, the largest percentage of freely accessible scholarly articles were on .edu sites (41%), followed by .org sites (28%), and then by .net sites (23%), which were mostly academic social networking sites. The smallest percentage of scholarly articles (8%) were

accessible for free on the .com websites of publishers. These findings suggest that institutional repositories, not for profit research organizations and academic social networking sites are significantly contributing to the green open access movement. However, gold open access, meaning journals that provide free access to the entire journal—not just select articles—constituted the smallest percentage of the open access journals. Out of the 89 journals found on the open web, only 18 or 20% were to gold open access journals, and all these gold open access journals were published by universities on .edu sites or research organizations on .org sites. None were available through the sites of commercial publishers. This is consistent with broader studies that show about 13% of all journals meet the gold open access criteria (Schimmer, Geschuhn and Volger 2015).

### ***News articles***

News articles were the third most frequently cited type of content, comprising 13% or 96 of the 552 citations (see Table 1). Ninety three percent, or 89 of these 96 news citations, could be found by “just googling it”. And, 78 of these 89, were accessed by these students through the open web (see Table 2), even though over half were also available through the library (see Table 1). Given the proliferation of online news in all forms, including by legacy news providers (Singer 2017) it makes sense that the open web would be the preferred discovery and delivery method.

As shown in Figure 5, the vast majority of these news articles available on the open web (91% or 72 of 89), were on .com websites. This not only reflects the commercial nature of news but also the fact that most U.S. newspapers now provide free access to at least a few articles before requiring a subscription (Williams 2016). Whether these first-year students understand the strengths and weaknesses of the different online news sources and that the library provides unlimited access to the full archive of many legacy news sources, are different questions.

### ***Monographs***

Monographs were the fourth most frequently cited type of content, comprising 12% or 65 of the 552 citations (see Table 1). This study clarifies that “just googling it” is not an effective strategy for getting access to monographs. Almost 90%, or 58 of the 65 monographs, were only available through the library (see Figure 4). The types of monographs found on the open web included an open media book, a book that was out of copyright that was scanned and uploaded to a university’s website, and chapters (not the entire book) that were uploaded to websites.

### ***Reference works***

Reference works were the fifth most often cited type of content, making up 7% or 37 of the 552 citations (see Table 1). Like monographs, the library continues to be an important provider of reference works and acted as the exclusive source for 62% or 23 out of 37 of the cited works (see Figure 2). However, because 38% or 14 out of 37, of these reference works (see Table 1), were also available through the open web, “just googling it” is a strategy that might work to some extent for this type of content. Based on the websites supplying these reference works (see Table 3), this may be truer for general reference works than the 1000s of specialized encyclopedias and reference resources available through the library. Citations to Wikipedia were conspicuously absent, perhaps because of instructions by faculty not to cite Wikipedia as a source, even though it is increasingly acknowledged in all types of contexts, as a great starting point for research much like any encyclopedia (Jemielniak and Aibar 2016).

### ***Limitations of the Study***

The analyzed citations were from the December 2016 poster session but the searches for this study were ongoing through 2019. Since library collections, discovery systems and the availability of content on the open web are by design in a constant state of change, the results of



this study are only evidence of the breadth of appropriate sources on the open web, not that a particular work will always be available in a certain location.

If it was unknown whether a source was accessed through the library or the open web because no URL was provided as part of the citation and the resource was available in both places, it is possible that at the time the student did their research the resource was not available on the open web. Since scholarly journal articles, made up 90% or 77 of the 87 works in this category (see Table 2), maybe these articles became available through institutional repositories or academic social networking sites after the students completed their posters. In addition, using the URL provided as part of a citation as evidence that the student accessed the material through the library or the open web, when available in both places, is not conclusive evidence that the student actually accessed the content using that URL since the URL could have been constructed.

Independently evaluating the cited works for quality or relevance, other than to assume they met the course requirements by inclusion in the showcase event and attribute value to them based on content type (such as scholarly articles or monographs) and domain names (commercial vs. other types of sites), is a complex process and was beyond the scope of this study. A future study might include such an evaluation, particularly regarding content from miscellaneous websites being used to support the academic work of undergraduates.

Apart from acknowledging that teaching can influence what students cite, this study does not measure the impact of instruction efforts by librarians or course instructors. Instead, it examines whether the cited works were available for free on the open web regardless of whether the student found them on the open web or through the library and regardless of why they decided to cite them. As increasing amounts of content that supports academic work becomes

available on the open web, a future study might focus on how this affects teaching and collections.

## **Conclusion**

“Just googling it” may be good enough to meet the research needs of first-year students. Proprietary library databases offering scholarly articles, news and reference materials, are not the only sources for reputable content. Quality information is freely and easily accessible on the open web, particularly through educational and nonprofit websites, and often because of the efforts of librarians. However, being good enough, although a useful starting point, raises bigger questions for libraries and students alike. Who gets access to information and why? How can information be trusted? How do filters and algorithms impact research?

If Google is “good enough”, then it calls for libraries to shift towards prioritizing its services over librarians’ role as gatekeepers and curators of information. Continuing to monitor for gaps in content will remain important. However, libraries will need to establish a renewed and vigorous commitment to teaching information literacy concepts and skills that are transferable across information systems including how to access quality content for free. Students should know why and where the Internet and libraries intersect as content providers and how to successfully search on different platforms that are in a state of rapid and continuous flux.

Since students seem to prefer the open web, it is also a call to make it easier to use the library. Most information seeking behavior is driven by convenience and search strategies requiring the least effort (Komissarov and Murray 2016; see also Schwieder 2016), an area in which open web search engines excel. Using a simple search box that

finds all types of resources in one search, mimicking the open web search experience, might encourage more students to use resources only available through the library.

Libraries, which want users to access quality content regardless of location, are in a unique position to be leaders in adapting to and teaching about both open and proprietary systems. They should continue efforts to make scholarly content accessible to as many as possible and to instruct users to navigate hyper-linked information systems. By doing so, libraries will meet students where they are and help them do research that is much more than “just good enough”.

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