

## Wikipedia and undergraduate research trajectories

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## **Wikipedia and Undergraduate Research Trajectories**

### **Introduction**

The undergraduate student researcher has to balance many, often competing, considerations when selecting the sources to include in their academic papers. Among them, assignment requirements, prior experience with online resources, and the ever-important factors of ease and convenience have to be negotiated. The students' motivation and social influences also play a role in what ultimately becomes their research path, culminating in those first efforts in academic writing. While the research process of undergraduates is complex and multi-faceted, one common feature in their journey remains the popular online resource Wikipedia.

Wikipedia's popularity with undergraduates is due to several factors, including its accessibility and the diversity and currency of the topics covered. 82 % of college students have reported using Wikipedia to obtain background information about a topic for course-related research (Head & Eisenberg, 2010). Overall, "it is unsurprising that Wikipedia's egalitarian approach to presenting information, its user friendly design, and its free availability make it a popular source of information for undergraduate students" (Colon-Aguirre & Fleming-May, 2012, p. 392).

In the past several years, a number of studies have explored the perceptions, motivations, and attitudes of students who use the online encyclopedia (Chung, 2012; Lim, 2009). In the literature of library and information studies there is both concern about the quality of Wikipedia articles and an acknowledgement of its pervasiveness (Rand, 2010; Chesney, 2006). Recently, there has been a call for libraries to work closer with Wikipedia to create a mutually beneficial relationship, where more scholarly content is being used to create Wikipedia pages. Notably, the "Wikipedian in Residence" program has enabled universities to liaison with Wikipedia by

providing in-house content and greater access to library collections that are linked in the bibliographies of Wikipedia articles (Garber, 2014). In addition to guiding traffic to the library, these projects could result in training opportunities for librarians who wish to understand the editorial culture of Wikipedia, in order to educate and advocate to the university community. Important applications of Wikipedia as a learning tool for information literacy have also been recognized in the field (Calhoun, 2014). The evolution of the Wikipedia-library collaboration has the potential to result in emerging services that impact librarians, students, and teaching faculty.

One fundamental aspect, however, remains unknown: How do undergraduates actually use Wikipedia and how does this resource influence their subsequent information-gathering? It remains unclear whether students use the bibliographies of Wikipedia pages as a finding aid for additional content through the library's databases. It is also unknown if students are able to critically evaluate the quality of sources that are linked in these bibliographies, in order to use them to advance their research assignments.

This article will highlight the results of a study of 30 undergraduates at a large state university. The study was designed around several research questions:

- i. What steps do students take to find information *after* reading an article entry in Wikipedia?
- ii. Do the references (or bibliography) sections of Wikipedia articles encourage the discovery of library collections?
- iii. How do students determine the authority and quality of Wikipedia's citations and can students benefit from using a structured rubric to evaluate sources within Wikipedia?

## **Literature Review**

Three themes in the literature concerning Wikipedia are especially important for this study: 1) Ease of access, 2) Evaluating authority/quality, and 3) Wikipedia as a discovery tool.

A very useful study on how undergraduates prioritize their work and the importance of understanding their research processes was conducted by Mizrachi & Bates (2013): “Understanding how students approach their complex academic information worlds is of primary importance today as academic libraries and educational institutions face the challenge of pioneering new and relevant services in a variety of virtual and print formats under increasing budget constraints” (p. 1590). The study looks at how students integrate digital tools in their daily routines and considers the complex world of undergraduates’ “information ecologies” (p. 1591). One of Mizrachi & Bates’ (2013) major findings is that students consistently arrange their information ecology, both physical and digital, in ways that maximize accessibility and visibility (p. 1603). Furthermore: “their organizational schemes are driven by accessibility, visibility, urgency, and work flow factors which vary by context and are impacted by the multiple time factors, deadlines and calendars inherent in academia” (p. 1605).

Colon-Aguirre & Fleming-May (2012) advance a discussion of the research trajectory of undergraduates by defining three types of library users: *avid*, *occasional*, and *avoiders*. Avid users begin their research process at the library website, using library resources, rather than Google or Wikipedia. They tend to fit the concept of using Wikipedia as a discovery tool by using it primarily to gather background information on their topic and then moving on to library resources. Avid library users recognize the superior quality of sources in library databases. On the other hand, occasional library users do not have a consistent research trajectory. While they can recognize the superiority of some library content, they are not likely to consult that content, unless they are explicitly instructed to. Library avoiders reported being overwhelmed and

confused by library websites. They prefer to use easy-to-navigate resources found through Google and Wikipedia for their assignments. These users have a complex research trajectory that frequently does not include library resources at all. The study also shows that occasional and avoider users are much more prevalent than the avid library users (p. 394).

Colon-Aguirre & Fleming-May (2012) make the valid observation that mapping undergraduate research trajectories is confounded by the fact that Google and Wikipedia are frequently one of the same access point. Students search Google in order to access Wikipedia, since Wikipedia entries are almost always at the top of the results list: “While Wikipedia usage was the initial point of interest for this study, most of the students interviewed expressed that they usually reach the Wikipedia site by searching for a term on Google or another search engine and not by going directly to Wikipedia” (p. 394). It is very difficult, in other words, to separate the two: “In fact, several respondents said that they ‘never’ begin a search that concludes with a Wikipedia entry by first visiting the Wikipedia.org website” (p. 396).

Beside convenience, instructors and faculty are an important influence on student research trajectories. Students are often warned against using Wikipedia, as a rule, as opposed to being taught to evaluate information on Wikipedia critically (Colon-Aguirre & Fleming-May, 2012). This approach, according to the authors, can have negative repercussions. They advise academic librarians and teaching faculty to “reinforce their understanding that students tend to pay close attention to what their instructors say, at least in regard to establishing requirements for information sources as part of a class project. Unless instructed otherwise, students seem to abide by [the] principle of least effort when searching for information to use in their coursework and rely on free online websites that they locate using a search engine” (p. 396). The authors call for

a collaborative effort between instructors and librarians in teaching critical thinking and evaluative skills.

Lim (2009) surveyed over a hundred students on their use of Wikipedia. The purpose of the study was to explore college students' perceptions and motivations for using Wikipedia, as well as to understand their information behavior concerning Wikipedia. The study used "uses and gratification" approach to explore the attitudes of participants. The author explored the effect of several variables on the students' use of Wikipedia: past experience, vicarious experience (whether classmates use Wikipedia), verbal persuasion (whether they have been encouraged to use Wikipedia by others), emotional state, disposition to believe information, information utility (whether Wikipedia is easy to use), outcome expectations (whether the information task is accomplished through Wikipedia), and frequency of use of the resource (Lim, 2009, p. 2194).

Lim's (2009) findings are quite interesting and revealing. First, and not surprisingly, "Wikipedia was used more frequently than library databases" (Lim, 2009, p. 2199). The respondents reported using Wikipedia for both academic and non-academic purposes. As to "why" students use the resource, the author states that "with respect to information characteristics, the accuracy and trustworthiness of information were not essential reasons as to why students used Wikipedia" (Lim, 2009, p. 2195). Students in this study were more interested in "reasonably good" information than in "accurate information" (Lim, 2009, p. 2195).

Another interesting and complex finding by Lim (2009) is that while respondents had overwhelmingly positive experiences of using Wikipedia, they also rated its authority/quality rather low. The author relates this finding to "incredulity errors," or skepticism on the part of the students: "In other words, it appears that the uneasiness associated with the anonymous authorships of Wikipedia has led to nonexpert users' underestimation of the reliability of

Wikipedia, which has apparently affected their perceptions of information quality” (Lim, 2009, p. 2199). Perhaps another interpretation could be the influence of faculty and librarians on students, in their tendency to discourage the use of Wikipedia and disparage the quality of its information, despite studies that have shown that the resource is fairly reliable (Chesney, 2006).

As Little (2012) points out, “fewer and fewer users are starting their research on academic library websites or the library catalog, turning instead to Google, Wikipedia, or other online resources, most of which are not collected by the library or made available by librarians online” (p. 346) . To alleviate this issue, libraries have recently embarked on efforts to work closer with Wikipedia and contributing in-house content to Wikipedia pages. This could reveal a potential use of Wikipedia as a discovery tool for library content.

There is a wealth of literature on discovery tools which compare and contrast library resources to the Google environment. Rose-Wiles & Hofmann (2013), defines web-scale discovery as “ a centralized index of metadata obtained from many publishers and database vendors as well as the subscribing library’s OPAC, institutional repository, and other selected resources, returning results almost instantly” (p. 150). When linked to the library, bibliographies in Wikipedia pages could serve as this mechanism. Arnett & Forrestal (2012) and Elder, Westbrook, & Reilly (2012) discuss efforts to connect users from the Wikipedia environment to the library databases, increasing their access and awareness of unique digital collections. Projects such as this could potentially create a new service for libraries, where Wikipedia is the discovery layer of library collections.

## **Method**

The 30 student participants were recruited from spring 2014 semester courses in the Writing Across the Curriculum Program. The study was administered in a controlled environment (library computer lab), to ensure that participants were given proper context and instructions for completing it. Students were given a pre and a post test of their understanding of issues related to the authority of sources, as well as their procedures for prioritizing the research process. The participants were presented with a hypothetical research assignment, which required them to read a Wikipedia page as a starting point.

Primary dependent variables included whether students were likely to go to the library resources after reading the Wikipedia page and if they would choose to follow links from Wikipedia bibliographies, in order to obtain more sources for their research. The students were asked to rate the quality of the Wikipedia sources according to a rubric, which was adapted from the Source Educational Evaluation Rubric (SEER), provided by Turnitin® ([http://pages.turnitin.com/seer\\_rubric.html](http://pages.turnitin.com/seer_rubric.html)). The original rubric was reduced to one category, “Authority.” The rubric was preferred choice for this study because it is an established and calibrated educational tool and there is a precedence of its use in the context of Wikipedia source evaluation.

The researcher used the responses collected in the survey to map a research trajectory for students who use Wikipedia as a starting point for their research assignments (see Figure 1).



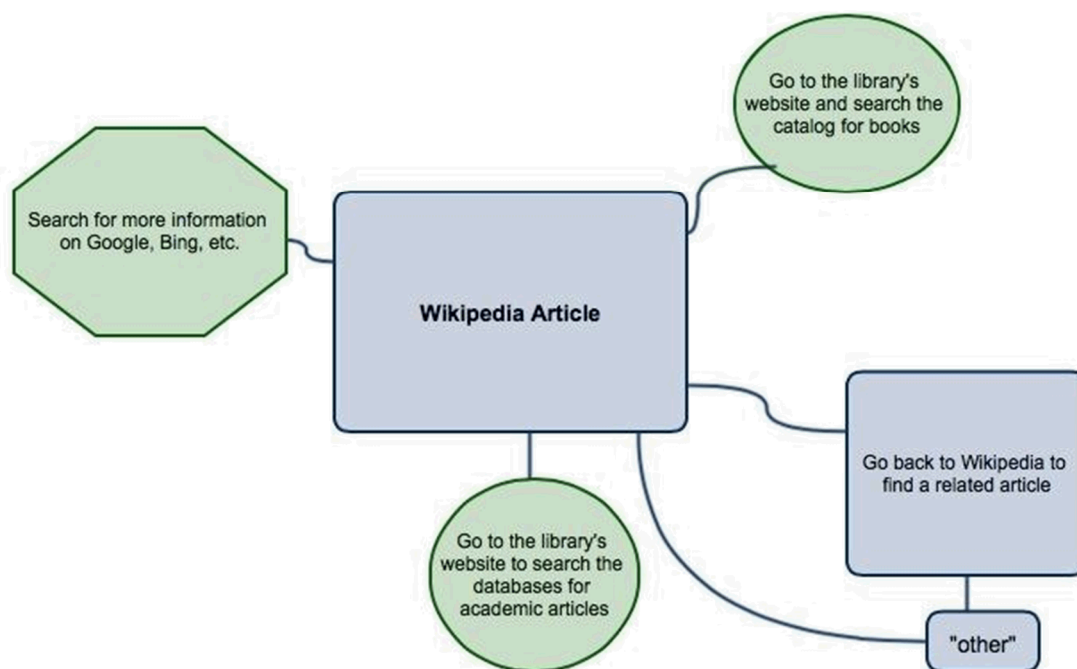


Figure 1

## Results

*Pre and Post Test:* The pre and post test asked students to compare a scholarly and two non-scholarly sources, in terms of its likelihood of incorporating the best research on a given topic. In the pre test, 87% of students selected the scholarly source (academic journal article) over the non-scholarly ones (newspaper article and a blog). It is notable that 3 students selected the major media blog as their preferred choice. In the post test, which asked the same question with another set of scholarly and non-scholarly examples, 97% of students recognized the scholarly article as the better choice.

*Source selection priorities:* When asked about their priorities for selecting research sources, 24 of the 30 participants rated “Ease of Access” as the most important consideration, followed by the currency and authority of the source. Whether or not the source had an extensive bibliography was considered the least important factor (see Figure 2).

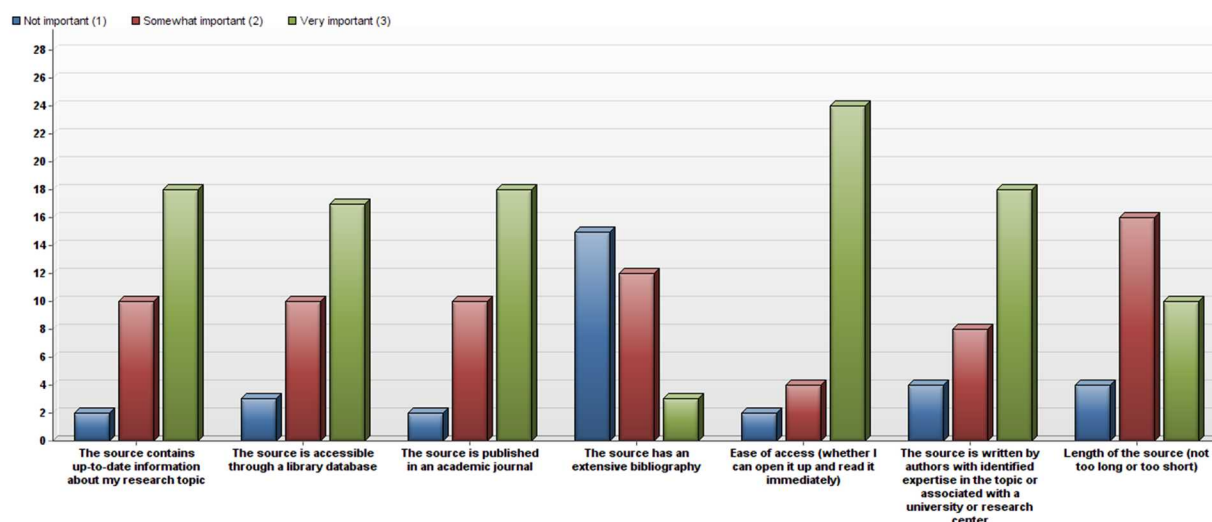


Figure 2

### *Use of Wikipedia*

The study revealed that 36 percent of the sample population will use Wikipedia as their starting point for research assignment.

### *Information-gathering after Wikipedia*

The investigators selected a Wikipedia page for all participants to read. The page “Internet Privacy” was the preferred choice because it had only one bibliography page (it is common for Wikipedia articles to have two “Notes” and “References” sections, which would make the task

confusing). After reading the Wikipedia article, students were most likely to go to Google for more information, followed by the library's databases, or returning to Wikipedia. 70% of the respondents chose one of these three options. Going to the library catalog or following Wikipedia references were least preferred as next steps in the research process.

### *Using Wikipedia Bibliographies*

When asked if they were, in general, likely to follow references in Wikipedia, 19 of the 30 students were "unlikely" or "very unlikely" to do so. Participants elaborated further in their comments:

- "Last thing I would do would be to use the reference section because it is the last section of the article that not many people (including me) read or even take their time to look over."
- "I've never even considered doing this."
- "It is the last section that I do not really take into consideration. I feel as though most of the reference content is already on the wiki article so there would be no reason for me to further look into that reference. "
- "Many of the sites that Wikipedia [uses] may very well look credible, but they just look messy and cluttered and it makes me not want to get more information from them. I barely ever scroll down far enough to see the reference notes because the articles are usually very long and provide unnecessary information. If I go to Wikipedia, I would prefer to go there for a summary, but not for very detailed and specific information."
- "Generally, articles on Wikipedia are extremely long and detail-oriented in which the reader will only skim the article, skipping over the reference or note section."

Next, participants were prompted to select two Wikipedia bibliography entries to follow (despite whether they would naturally do so on their own). This section of the survey was designed to determine if students are likely to follow more scholarly or non-scholarly citations. 60% of the citations the participants selected came from the first twelve references to appear in the references page. It should be noted that Wikipedia bibliographies are arranged by the order they appear in the article. None of the first twelve references in the page were from scholarly sources. Moreover, the most popular choice (also the first citation in the bibliography), is a non-

peer reviewed conference proceeding from 1965. Given the nature of the subject matter of the Wikipedia page students were assigned to read (internet privacy), it can safely be said that this choice does not contain the most current information. A few additional few comments were especially revealing:

- “It was the second source on the list so I figured it must be the 2nd best”
- “This is the first source, I am most likely to go in order”
- “I think it is easiest/most convenient to select the first source”

## **Limitations**

While the results of this small-scale study were revealing, there are several limitations. First, the study only recruited students in the Writing Across the Curriculum Program, which does not represent the entire population of undergraduates. Future studies would benefit from a greater recruitment of participants. Further studies should consider students in different subject disciplines. While the present study relied on a survey in a controlled environment, follow-up efforts should consider a mixed methods approach of interviews, focus groups, and observations, in order to gain a fuller picture of undergraduates’ use of Wikipedia in their research trajectories.

## **Discussion and Implications for Future Study**

Several themes emerge from the results of this study, which may help to elucidate undergraduate research trajectories, especially in the context of emerging and future Wikipedia-Library collaborations.

### *Understanding Student Research Trajectories*

Respondents overwhelmingly indicated that they used Wikipedia because it was easy to access. The students in this population sample clearly approached the research process in a way similar

to what Mizrachi & Bates (2013) observed, focusing on visibility and accessibility. When asked to choose a reference to follow from the bibliographies, the students overwhelmingly selected one of the first twelve, which also confirms their preference for convenience. When choosing sources in general, authority/quality of the source was not the most important consideration and the characteristics of the source's bibliography were not considered important.

However, it should also be noted that students in the sample rated Wikipedia itself as "Credible," but not "Highly Credible," according to the SEER rubric. This suggests certain ambiguity in how students perceive the issue of authority/quality of sources. Although students see that academic journals are "highly regarded," it may be that they don't necessarily think that the status means that the content is better able to satisfy their current information need. These findings, in fact, confirm Lim's (2009) observations, which revealed that students are more interested in "reasonably good" information than in "accurate" information (Lim, 2009, p. 2195). It may also be that undergraduates are skeptical of what they have been told is "highly regarded" information, in a world of increasingly open access and freely available resources. This difference in perception is an interesting element to explore and address in a future study.

While credibility and authority are also important and do impact the research trajectories of students, they are only second in line for consideration. The urgency of the task and the convenience of Wikipedia and Google, as revealed in the students' comments, remain central influences. The results of the study revealed that students tend to fall in a "loop," when they start their search for information on Wikipedia; often following it up by going to Google or returning to Wikipedia. As Colon-Aguirre & Fleming-May (2012) have shown, the two are actually very difficult to extricate. This leaves the library resources as a less preferred and frequently unused option. While librarians have for a long time tried to combat this issue, they have frequently done

so by fully rejecting Wikipedia as a starting point. It may be more appropriate to reverse this trend and, instead, involve students in the creation and editing of Wikipedia pages, in order to educate students about source authority, credibility, and the complexities of the Wikipedia editorial process, through which a large part of our conception of common knowledge is created today.

### *Implications for Wikipedia-Library Collaborations*

With the evidence that Wikipedia clearly remains a staple in undergraduate's research trajectories, the "Wikipedian in Residence" program and other Wikipedia-library collaborations seem timely and appropriate. Perhaps the most important implications of this study are for envisioning the future role of libraries in relationship to Wikipedia. While the potential to use Wikipedia bibliographies to discover library collections is clearly inherent, students are also not taking full advantage of it. The findings indicated students are not likely to follow the reference links at the end of Wikipedia to look for additional information. Based on the findings, it may be appropriate for information professionals and educators to develop information literacy strategies to help students evaluate these references.

The findings also shed light on certain peculiarities of Wikipedia use, which may enable Wikipedia developers to enhance its interface. If the goal of the Wikipedia's collaborations with academic libraries is, in fact, to increase the use of Wikipedia as a gateway to library resources (via Wikipedia bibliographies), it may be worth for Wikipedia to develop a visualized ranking mechanism for its references. Moreover, the students' comments revealed that they greatly benefited from using a structured rubric to evaluate the bibliographies in Wikipedia. It is possible to envision that Wikipedia could adopt a rubric tool for use by its readers, in order to assist with

that process, and enable this critical moment of resource discovery. Such a rubric tool would, in fact, allow students to “develop and employ strategies to assist their cognitive absorption and understanding of the information (Mizrachi & Bates, 2013, p. 1600).

It is crucial for both faculty and librarians to increase their understanding of the culture of editing in Wikipedia, as well as to continue collaboratively enhancing the quality of information it contains. With librarians’ involvement of editing Wikipedia, the general public will benefit from the resulting information, which would reference both open and non-open access information. However, it will be very difficult for the future of Wikipedia and library collaborations to be successful in isolation from teaching faculty: “Both researchers and librarians need to pay attention to the fact that Wikipedia is a wanted source. That is, the academic community must find out why this is and how to contribute to improving the information quality of Wikipedia” (Lim, 2009, p. 2199).

As Colon-Aguirre, M. & Fleming-May, R. found in their 2012 study, faculty and instructors are an important influence on whether students consider Wikipedia to be a legitimate starting point for their research. As a follow-up to the present study, a survey of faculty’s use of Wikipedia will also be administered. The survey will illuminate faculty and instructors’ perceptions of Wikipedia and their own uses of the resource for information-gathering. This information will reveal another dimension of students’ expectations and directions when using the source, as well as potential opportunities to develop outreach and integrate Wikipedia in the curriculum.

## **Conclusion**

This study investigated college students' use of Wikipedia bibliographies. The investigator found that a majority of respondents, 24 of 30, considered ease of access as the most important consideration when working on a research paper, followed by the authority/quality of the sources found. These observations agree with recent studies (Head & Eisenberg, 2010; Denison and Montgomery, 2012), illustrating that college students are more likely to choose information that is easily accessible. This study has also found roughly two thirds of respondents would not choose to follow the links to citations in the bibliographies of Wikipedia articles. This suggests that students are not taking full advantage of the potential of Wikipedia as a discovery tool for library content. The study revealed important implications for both the design aspects of Wikipedia citations and the emerging collaborations between Wikipedia and libraries, which would benefit from closer involvement with teaching faculty. The relationship between academic libraries and Wikipedia is evolving towards a partnerships, which has implications for library services and the role of librarians as information literacy educators, Wikipedia editors, contributors, and advocates.



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