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How today's college students use *Wikipedia* for course-related research

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Abstract

Findings are reported from student focus groups and a large–scale survey about how and why students (enrolled at six different U.S. colleges) use *Wikipedia* during the course–related research process. A majority of respondents frequently used *Wikipedia* for background information, but less often than they used other common resources, such as course readings and Google. Architecture, engineering, and science majors were more likely to use *Wikipedia* for course–related research than respondents in other majors. The findings suggest *Wikipedia* is used in combination with other information resources. *Wikipedia* meets the needs of college students because it offers a mixture of coverage, currency, convenience, and comprehensibility in a world where credibility is less of a given or an expectation from today's students.

Contents

Introduction

Want to stir up a room full of college faculty and librarians?

Mention *Wikipedia*.

Wikipedia, the online, peer–produced encyclopedia, is one of the most discussed topics on campuses today. Much of the academic debate turns on issues about *Wikipedia's* reliability, completeness, accuracy, and intellectual rigor and whether college student should, or should not, use the collectively produced encyclopedia for course–related research assignments [1].

Yet at the same time, very little is known about how and why today's college students actually use *Wikipedia* during the course–related research process.

In this paper, we present findings from a survey of U.S. college students on six campuses during the spring of 2009.

We investigated the use of *Wikipedia* for course–related research in five related areas:

1. How frequently college students use *Wikipedia*.
2. What motivates students to use *Wikipedia*.
3. At which stages of research students use *Wikipedia*.
4. How *Wikipedia* is used in relation to other information resources.
5. What predictors reveal which types of students are more and less likely to use *Wikipedia*.

Methods

The findings reported in this paper are part of Project Information Literacy (PIL), an ongoing national research study, based in the University of Washington's Information School [2].

We conducted the research about *Wikipedia* usage in two phases during 2008 and 2009.

Phase 1: Student focus groups

The PIL team conducted 11 student focus groups on seven campuses in the U.S between October and December 2008 [3]. On average, each session was 90 minutes long.

The student focus groups provided qualitative data about students' research habits, behaviors, experiences, and the obstacles that they encountered. A segment of the sessions focused on course–related research and how students used *Wikipedia*.

We define course–related research in broad terms — from the moment students receive a research assignment through collecting and evaluating materials until the final writing of a mid–course paper (*e.g.*, five–eight pages).

In total, 86 students participated in the sessions. Far more females (70 percent) than males participated in the focus groups [4].

Participants ranged in age from 20 to 30 years old. Students were full–time sophomores, juniors, seniors from four–year public and private colleges and universities, and full–time community college students, who had completed at least one semester at the institution [5].

The focus group sample consisted primarily of students in the humanities or social sciences. This group of students, we assumed, was likely to be acquainted with secondary research methods [6].

The mean GPA for the total student sample across all seven schools was 3.44, or just above a B+ average.

Phase 2: Student survey

A survey was distributed to 27,666 students on six campuses in the U.S. between April and May 2009. The study sample was 2,318 responses. The overall response rate was eight percent.

The 32–item survey was administered online, using survey software provided through the University of Washington.

Surveys were sent to students' e–mail addresses, which were provided through each school's Registrar's Office [7]. The survey instrument underwent a Human Subjects Division review at each participating institution.

The purpose of the survey was to collect data about information needs and behaviors of respondents during course–related and everyday life research. The survey instrument was informed with qualitative data from the student focus groups in Phase 1.

We sampled students studying in all major disciplinary areas (*i.e.*, humanities, social sciences, sciences, education, engineering, business, and occupational training) [8].

The survey sample consisted of sophomores, juniors, or seniors at four–year institutions (n=1,627) and full–time students who had take 12 units at the community college at which they were enrolled (n=691) [9].

More females (65 percent) than males (35 percent) took the survey. The mean grade point average (GPA) for the total student sample across all six schools was 3.4, or a B+ average [10].

We used PASW (Version 17.0) as a statistical tool for calculating frequencies, cross tabulations, and logistic regressions.

We acknowledge that our findings are not generalizable to the full student college population. However, our analysis of *Wikipedia* use does show consistent responses and fairly robust relationships among variables from a large sample of students at six separate educational institutions in the U.S.

Results

Major findings from the study are as follows:

1. Far more students, than not, used *Wikipedia*. *Wikipedia* was used in addition to a small set of other commonly used information resources at the beginning of the research process.
2. Reasons for using *Wikipedia* were diverse: *Wikipedia* provided students with a summary about a topic, the meaning of related terms, and also got students started on their research and offered a usable interface.
3. Respondents who were majoring in architecture, engineering, or the sciences were more likely to use *Wikipedia* than respondents in other majors [11].

Using *Wikipedia*

The signature research assignment for humanities and social sciences courses is the argument paper (67 percent). These papers entail choosing a topic, defining an issue, and taking a position backed by evidence culled from secondary resources (*e.g.*, books, journals, and resources found on the Internet).

To a lesser degree, students reported conducting "outside research" for other course–related assignments that were interpretative readings of a text (53 percent), historical analyses (39 percent), and literature reviews (38 percent).

Over half of the survey respondents (52 percent) were frequent *Wikipedia* users — even if an instructor advised against it [12]. Students reported that they frequently, if not always, consulted *Wikipedia* at some point during their course–related research (see Figure 1).

Far fewer of the respondents (22 percent) reported that they rarely, if ever, used *Wikipedia*.

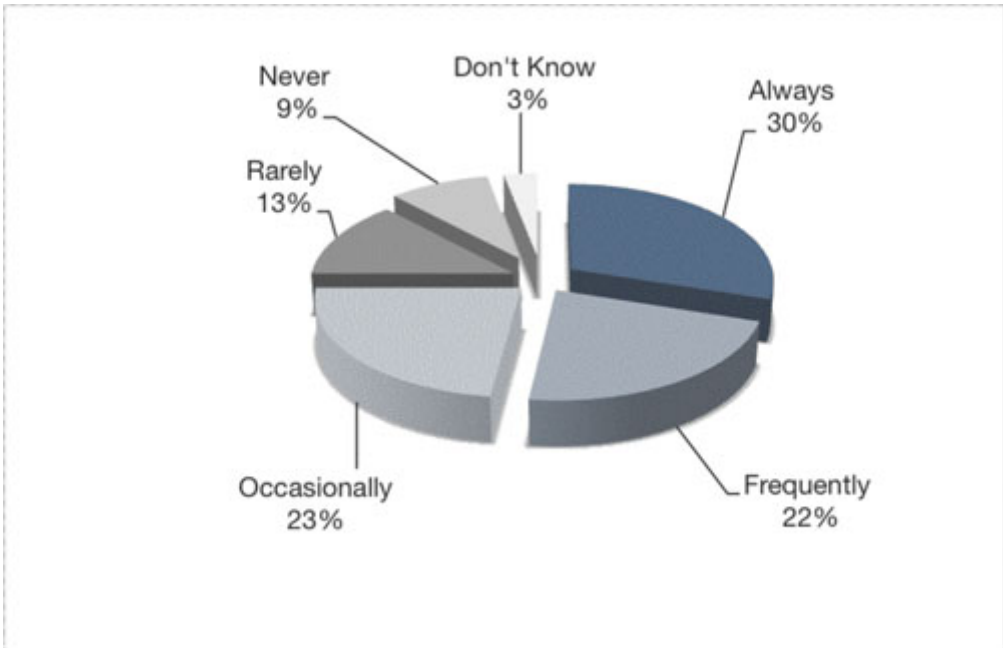

Figure 1: How often do students use *Wikipedia* during the course–related research process?

Why *Wikipedia*?

Students used *Wikipedia* for a variety of reasons. More than any other reason, 8 in 10 survey respondents (82 percent) reported that they went to *Wikipedia* to obtain background information or a summary about a topic (see Figure 2).

Wikipedia clearly has value to students as a workaround for previewing a topic. As one student in our sessions simply said, "*Wikipedia* tells me what's what."

Respondents also reported that they turned to *Wikipedia* because it: (1) helped them get started (76 percent); (2) featured an easy to use interface (69 percent); and, (3) helped them find the meaning of terms and use of language used about certain topics (67 percent).

Wikipedia's greatest value to students may be its ability to alleviate common frustrations students initially have with conducting research [13]. Some students in our focus sessions described a vicious cycle during the research process from the outset.

Students reported they could not begin their research process until they had an idea of what they were going to write about. They did not think that they could approach an instructor about an assignment, until they knew more about their topic. They did not use a scholarly research database early on, given the specificity of academic journal content.

Wikipedia was a convenient go–to source under these circumstances. The source delivered results students could act upon, allowing them to get unstuck and move forward.

To a slightly lesser degree, respondents used *Wikipedia* because the entries were easy to understand (64 percent), entries included hypertexted citations (54 percent), entries helped students figure out search terms (44 percent), or because entries had current, up–to–the–minute information (39 percent).

Fewer students in the sample used *Wikipedia* because they thought *Wikipedia* was more credible than other Web sites (17 percent). In addition, the wiki software, which allows for massively distributed collaboration, did little to drive student traffic. Few respondents (16 percent) considered shared authorship capabilities as a reason for use.

As a whole, the findings suggest that students used *Wikipedia* for its summaries and to get started, and because of usability, comprehensibility, and lesser so, for credibility or its peer–to–peer (*i.e.*, wiki) capabilities.

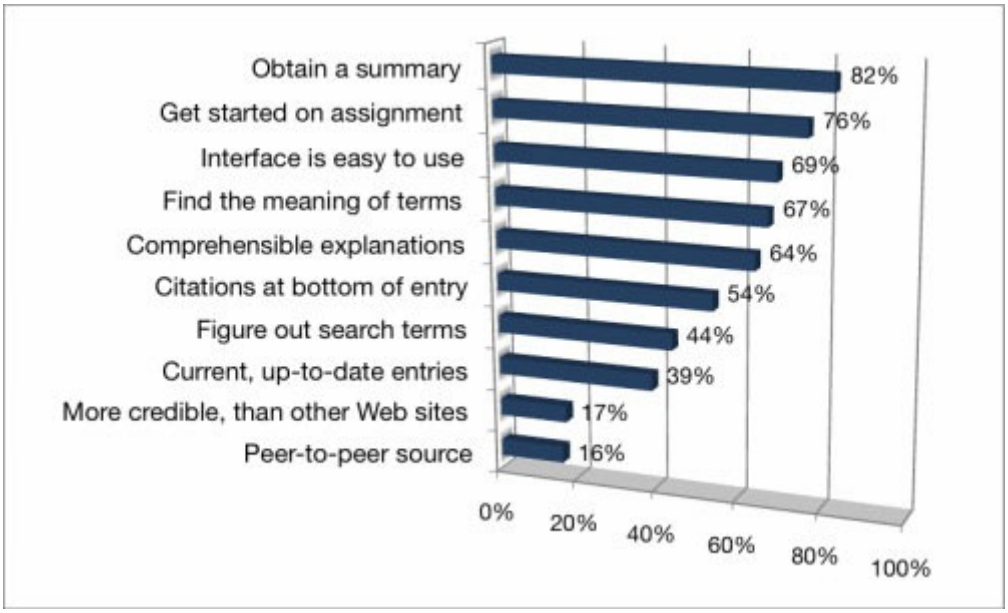

Figure 2: Why do students use *Wikipedia* for course–related research?

How *Wikipedia* fits into the research process

Most respondents (70 percent) reported using *Wikipedia* at the beginning of the research process (see Figure 3). Very few used *Wikipedia* near or at the end (two percent).

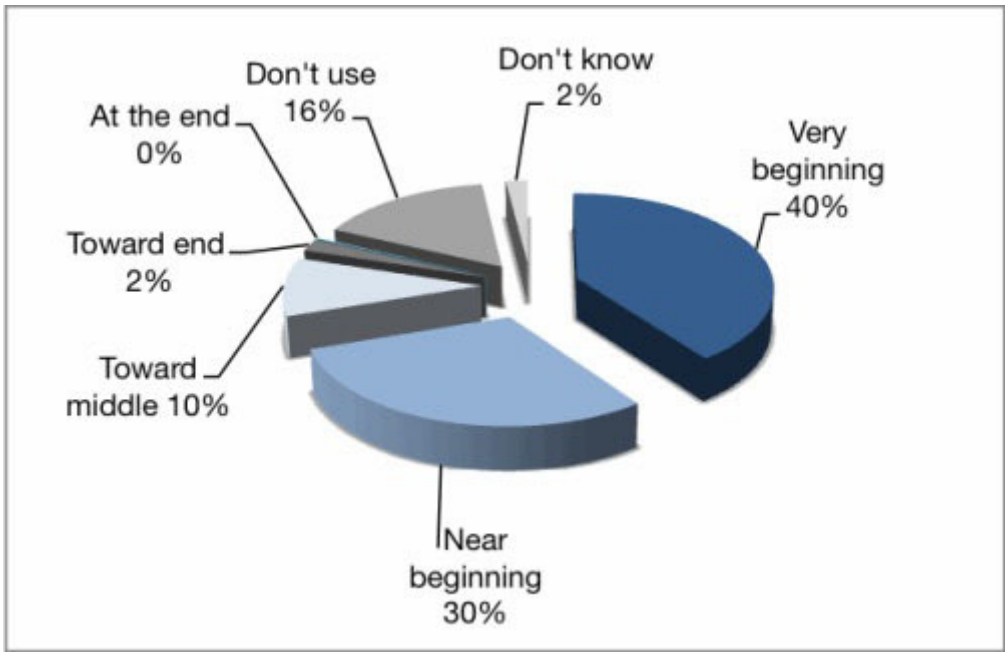

Figure 3: At which stage in the research process is *Wikipedia* used by students?

The survey results are consistent with accounts we heard in our student focus groups about when they use *Wikipedia*. Students in the focus group sessions were precise in characterizing *Wikipedia* as "a .5 step in my research process" or "the very beginning of the very beginning for me."

Students in the sessions explained that *Wikipedia* entries have value in the beginning because they provide a "simple narrative that gives you a grasp," "can point you in the right direction," and "help when I have no idea what to do for a research paper."

Another focus group participant called *Wikipedia* "my presearch tool." Presearch, as the participant defined it, was the stage of research where students initially figure out a topic, find out about it, and delineate it.

As one student put it, *Wikipedia* is ideal for big–picture background "in good English" and "putting me in my comfort zone" before moving on to more serious research (*i.e.*, scholarly research databases and to a lesser degree, library books).

The large majority of students we interviewed said they begin with *Wikipedia* despite professors' cautions about *Wikipedia* as an authoritative source. As a student in a focus group commented, "Sure, I use *Wikipedia* just to get a taste, even though my professors say not to."

Most students also said they do not tell their professors they use *Wikipedia*; they simply avoid citing it in their reports. This was particularly true in the case of students in our sample enrolled in four–year institutions, who more likely to use *Wikipedia* than students in two–year institutions.

Few students in our sessions ended their course–related research with *Wikipedia*. As one student in the focus group sessions described, “My professor says *Wikipedia* is a great place to start, but a horrible place to end.”

Moreover, we found almost all of the respondents in our survey reported using an information strategy reliant on a small set of common information sources — close at hand, tried and true [14].

Students exhibited little inclination to vary the frequency or order of their use, regardless of where they were enrolled and despite all the online and in–person resources available to them.

Figure 4 presents a list of information resources used specifically for finding background during the course–related research process (listed from most to least used).

Figure 4: Which resources do students turn to for obtaining background about a topic?
Note: Listed in descending order from most to least frequently used resources.

Resources used for obtaining background about a topic	Frequency (% and N)
1. Course readings	97% 1,903
2. Google (*i.e.*, for finding sites other than *Wikipedia*)	95% 1,891
3. Scholarly research databases (EBSCO, ProQuest, JSTOR, etc.)	93% 1,823
4. Online Public Access Catalog (OPAC)	90% 1,791
5. Instructors	87% 1,662
6. *Wikipedia*	85% 1,675
7. Government Web sites	74% 1,381
8. Classmates	71% 1,362
9. Personal collection	69% 1,288
10. Library shelves	69% 1,312
11. Encyclopedias (print or online, *e.g., Britannica*)	61% 1,188
12. Friends	57% 1,088
13. Other search engines (*e.g.*, Ask, Yahoo!)	52% 1,022
14. Librarians	45% 865
15. Blogs	25% 474

These findings suggest when students needed background information, they turned to course readings, Google, online scholarly databases, the library’s online public access catalog (OPAC), and instructors — and less frequently to *Wikipedia* [15].

Who is likely to use *Wikipedia*?

We utilized a logistic regression to investigate which members in our sample were likely to be *Wikipedia* users.

Specifically, we examined the relationship of certain student characteristics (*i.e.*, institutional affiliation by two–year vs. four–year campus, major area of study, and information resource usage) with the likelihood that respondents would use *Wikipedia* for course–related research [16].

The results of the logistic regression and explanation appear in Figure 5.

Figure 5: Predicting the probability of using *Wikipedia* during course–related research.
Note: Variable(s) entered on step 1: campus_dummy, architecture, arts, business, education, occupational, sciences, Google–di, crlibr_di, instructor_di, creading_di.

	B	S.E.	*P*	Odds ratio	95% for C.I. odds ratio		Probability for using *Wikipedia*
					Lower	Upper	
*** Dummy variable (two–year institution)**	-1.23	.150	0	**.29**	.219	.394	22.48%
*** Architecture and engineering majors**	1.02	.288	0	**2.77**	1.578	4.878	73.47%
Arts and humanities majors	.262	.197	.184	1.30	.883	1.914	56.52%
Business majors	.455	.236	.054	1.58	.993	2.504	61.24%
Education majors	.59	.576	.303	1.81	.585	5.606	64.41%
Occupational training majors	.233	.219	.288	1.26	.822	1.939	55.75%
*** Science majors**	.625	.213	.003	**1.87**	1.232	2.834	65.16%
*** Google usage**	2.30	.225	0	**10.01**	6.435	15.562	90.92%
*** Librarian usage**	-3.90	.140	.005	**.677**	.514	.891	40.37%
Instructor usage	.340	.191	.075	1.40	.966	2.044	58.33%
Course reading usage	.062	.305	.838	1.06	.586	1.933	51.46%
Constant	-4.90	.372	.188	.613			

The model contained 11 independent variables in three general groupings: (1) two–year institutional enrollment; (2) majors in architecture and engineering, arts and humanities, business, education, occupational training, sciences, and social sciences (social sciences was the reference category); and, (3) information resources usage, including Google, librarians, instructors, or course readings [17], [18].

The model's dependent variable was "the use of *Wikipedia*." We determined use by students' response to a survey question about whether they used *Wikipedia* or not at some point during their course–related research process.

The full model containing all predictors of *Wikipedia* usage had a (Nagelkerke) R–squared value of 20 percent. In other words, 20 percent of all the variance in the use of *Wikipedia* can be accounted for by these variables, using this model.

As shown in Figure 5, five independent variables were associated with *Wikipedia* usage at a statistically significant (.05%) level. These variables appear bolded and asterisked in the first column of Figure 5.

Overall, the strongest predictor of using *Wikipedia* was being someone who also used Google for course–related research, with an estimated odds ratio of 10.00 or a probability of about 91 percent (controlling for all other factors in the model).

Two other predictors of *Wikipedia* usage were: (1) being an architecture or engineering major, with an estimated odds ratio of 2.77 or a probability of about 74 percent; and, (2) being a science major, with an estimated odds ratio of 1.87 or a probability of about 65 percent, compared to a social sciences major and everything else that is not explicitly included (controlling for all other factors in the model).

To a lesser extent, two more predictors of *Wikipedia* usage can be deduced from negative values reported in Figure 5. Respondents enrolled in two–year institutions were *less likely* than students in four–year institutions to use *Wikipedia*, with an estimated odds ratio of .32 or a probability of about 23 percent (controlling for all other factors in the model).

Respondents who used a librarian were *less likely* to use *Wikipedia* than those who don't, with an estimated odds ratio of .67 or a probability of about 23 percent (controlling for all other factors in the model).

In addition to the five statistically significant variables in our model, another six independent variables were not significantly associated (.05%) with the dependent variable.

Variables for which the odds ratio did not differ significantly from 1 (*i.e.*, a 50 percent chance that they would use *Wikipedia* and a 50 percent chance they would not) were students with majors in arts and humanities, business, education, occupational training and also the use of instructors or course readings for course–related research.

Overall, the predictors from our model about *Wikipedia* use are as follows:

1. Respondents who were Google users were 10 times more likely to use *Wikipedia* for course–related research than respondents who did not use Google (controlling for all other factors in our model).
2. Respondents majoring in architecture or engineering were almost three times more likely to be *Wikipedia* users, compared to social sciences majors (controlling for factors in our model). While respondents majoring in sciences were more than 1.5 times more likely to use *Wikipedia*, compared to social science majors (controlling for all other factors in the model).
3. Those enrolled in two–year campuses were *less* likely than those in four–year institutions to report that they used *Wikipedia*.
4. Those who consulted librarians were *less* likely to report using *Wikipedia* than those did not consult librarians.

Discussion

Few research studies have investigated how and why college students use *Wikipedia*.

The Pew Internet & American Life Project found that 50 percent of online users with a college diploma used *Wikipedia* to find information, based on a large–scale survey of U.S. residents (n=1,492) (Rainie and Tancer, 2007) [19]. The Pew researchers concluded that college students, and the "well educated," were more likely to use *Wikipedia* than those with only a high school diploma.

A recent study surveyed a small sample of communication majors (n=134) and found more than a third (39 percent) of the sample reported being frequent *Wikipedia* users (*i.e.*, had used *Wikipedia* more than 15 times in the prior semester) (Lim, 2009) [20]. Students used *Wikipedia* for obtaining background information and checking facts, even though their perceptions about information quality were not high.

Our research findings substantiate these studies' earlier claims: Many students are indeed *Wikipedia* users; many use the site for background information.

Yet our research provides a snapshot of which students may be more likely to turn to *Wikipedia* than others, too.

Students majoring in architecture, engineering, or the sciences, compared to other majors in our model, were more likely to use *Wikipedia* than other students in our sample.

One explanation for these findings may be these majors, more than students in other disciplines, may need additional background for their paper assignments.

Argument papers, the bread and butter of humanities and social science courses, may be unfamiliar territory for them. And the resources needed to complete these assignments may be unknown to them, too.

We also found students enrolled in four–year institutions were more likely to use *Wikipedia* than students in our sample enrolled in two–year institutions (*i.e.*, community colleges).

This finding suggests respondents from two—year institutions may have received more hands–on training about how to conduct scholarly research than at four–year institutions, given the curriculum and accreditation requirements in community colleges.

The four Cs

In a larger sense, our study also examined how *Wikipedia* fits into overall course–related research process of college students.

In general, we found *Wikipedia* was used, but less so than other resources that students frequently turned to for background information. When students were looking for background context they went to course readings, Google, scholarly research databases, and OPACs, more often than *Wikipedia*.

The findings suggest *Wikipedia* plays a part, but *Wikipedia* does not drive this part of the student course–related research process. This finding may help dispel some worries and concerns academics have about *Wikipedia's* omnipotence and its use as a solitary source of information.

In fact, we found that if a student uses *Wikipedia*, it is surgically and methodically applied; usually in the very beginning of the research process as a precursor to a more in–depth investigation of a topic.

Wikipedia plays an important role when students are formulating and defining a topic. But when students are in a deep research mode scholarly research, it is library databases, such as JSTOR and PsychINFO, for instance, that students use more frequently than *Wikipedia*.

As a whole, these findings suggest that course–related research is a complex and a multi–step process. Students consistently employ preferred problem–solving strategies for course–related research, based on efficiencies and using a mix of self–taught workarounds and some formally learned research methods.

All in all, *Wikipedia* has a unique *information utility*. We define information utility in terms of how useful a resource is to students, based on their needs, standards, and expectations [21].

Wikipedia's information utility is tied to four Cs it delivers — currency, coverage, comprehensibility, and convenience.

It is *Wikipedia's* hyper currency combined with a sheer range of coverage that is brief and easy to understand and access that makes *Wikipedia* useful and distinct from so many other sources (*e.g., Encyclopedia Britannica*, both the online and offline versions) [22].

On any given day, *Wikipedia's* breadth of coverage is something that was unfathomable a short time ago. One student in our sessions put it simply when discussing the value of *Wikipedia*: "Even Joe the Plumber is in *Wikipedia*!"

At the same time, we found credibility (another "C") was less of a criterion for *Wikipedia* usage. Only 16 percent of the respondents in our survey reported using *Wikipedia* because it was more of a credible source of content than other Web sites.

Students in our sessions assumed they would need to substantiate what they first found in *Wikipedia* in their early stages of research with some additional fact checking [23].

Some students in the focus groups told us if they doubted a *Wikipedia* entry, they did some fact–checking elsewhere — a news clip on YouTube to "see if the two things added up." Other students reported looking for *Wikipedia's* editorial notes (*e.g.*, the broom image at the top of an entry page, stating that an entry needed to be "cleaned up").

These findings suggest the advantage of using *Wikipedia* far outweighs its perceived drawbacks (*i.e.*, credibility and/or some professors' disapproval). Today's students appear to *negotiate* the accuracy of *Wikipedia* content, rather than assume it.

Conclusion

This study investigated how and why college students use *Wikipedia* within the context of using other resources for course–related research.

In particular, we investigated how *Wikipedia* fits into information–seeking strategies students employ for fulfilling course–related research assignments.

Overall, we found:

1. Students' driving need for background context makes *Wikipedia* one of the predictable workarounds that many students use, especially during the first stages of their research process.
2. Course–related research may begin with *Wikipedia*, but it rarely ends there. In our study, students employed a complex information problem strategy in their research processes, reliant on a mix of information resources that were from scholarly sources and public Internet sites.
3. In our study, we found the combination of coverage, currency, comprehensibility, and convenience drives *Wikipedia* use, in a world where credibility is less of a given — or an expectation from students — with each passing day.
4. Overall, college students use *Wikipedia*. But, they do so knowing its limitation. They use *Wikipedia* just as most of us do — because it is a quick way to get started and it has some, but not deep, credibility.

Opportunities

As a whole, our findings present some opportunities for librarians, educators, and information resource vendors.

The need for context–sensitive presearch sources and coaching services appears to be in high demand. There is a need for solutions that logically bridge the early stages of research to the rest of the research process and deliver the kinds of efficiencies students have come to expect (*e.g.*, the "four Cs").

When students have critical questions about narrowing down topics, figuring out search terms, and obtaining background information appears to be a critical time of need. It is a period of initial curiosity, but also one rife with inevitable frustrations in search of solutions. Our findings lead us to believe that support and solutions from multiple outlets, not just one tool, service, or individual, may work the best.

Whether these opportunities and our findings hold with students from other campuses is unclear. Further research about the use of *Wikipedia* by students needs to be conducted with different study populations.

Additional research about the relationship between using *Wikipedia* for course–related research and outcomes (*e.g.*, grades, quality, and learning) would lend to a deeper understanding of *Wikipedia* usage, too.

About the authors

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Notes

1. For a discussion of *Wikipedia* and its authority, completeness, and reliability, see the following: Scott Jaschik, 2007. "A stand against *Wikipedia*," *Inside Higher Ed* (January), at http://www.insidehighered.com/news/2007/01/26/wiki, accessed 16 December 2009; Simson Garfinkel, 2008. "*Wikipedia* and the meaning of truth: Why the online encyclopedia's

epistemology should worry those who care about traditional notices of accuracy," *MIT Technology Review* (November/December), at http://www.technologyreview.com/web/21558/, accessed 1 February 2009; and, Peter J. Nicholson, 2006. "The changing role of intellectual authority," *ARL 247* (August), pp. 1–5, at http://www.arl.org/arldocs/resources/pubs/mmproceedings/148/nicholson.pdf, accessed 24 November 2009.

2. See the Project Information Literacy Web site at http://projectinfolit.org.

3. The student discussion groups were held on seven campuses with full–time sophomores, juniors, and seniors at Harvard University, University of Illinois at Urbana–Champaign, Mills College, University of Washington, and with students, who had completed at least one semester at three community colleges, including Diablo Valley College (Calif.), West Valley College (Calif.), and Shoreline Community College (Wash.), during October, November, and December 2008.

4. For the discussion groups, we did not intentionally try to balance our sample for gender (one of the institutions in the campus sample was a women's college). Without this campus in the sample, more than half of the sample from co–ed campuses was female (63 percent).

5. We intentionally excluded any freshmen from our four–year institution sample and students who had taken fewer than 12 units from our community college sample. These students were more likely to discuss research strategies they had used in high school, rather than those they had developed (or were learning to develop) and had used, so far, in college.

6. In the discussion group sample, there was representation from students studying anthropology, art history, communication, economics, education, English, gender studies, global studies, health, history, international relations, languages, linguistics, music, political science, psychology, social studies, and sociology. To a much lesser degree (nine percent of the sample), some student "walk ins" were studying computer science, nursing, engineering, and business administration.

7. Survey respondents were full–time students enrolled at Harvard University, Illinois State University, University of Washington, and with students, who had completed at least one semester, at three community colleges, including Chaffey Community College (Calif.), Shoreline Community College (Wash.), and Volunteer State Community College (Tenn.) during April, May, and June 2009. A PIL research protocol underwent Human Subjects at University of Washington, the institution sponsoring the research, and at each institution in the sample.

8. We defined "majors" in broad terms in our study to include students with declared majors in a specific discipline at four–year institutions and also students with a primary emphasis of study at two–year community colleges. We used a logistic regression to determine which majors were likely to use *Wikipedia* (see section on "Who is likely to use *Wikipedia*" in this paper for details).

9. The largest category of survey respondents was sophomores (43 percent), though juniors (25 percent) and seniors (24 percent) also made up the sample. Students studying in arts and humanities, social sciences, and the sciences comprised nearly half (42 percent) of the community college sample and about three–fourths of the four–year college sample (74 percent). A number of students had declared "other" majors (n=255); many were attending community colleges and taking courses in occupational training (*e.g.*, dental hygiene, paralegal studies, radiology technician) and were recoded, as such.

10. For purposes of our analysis, we employed University of Washington's scale for translating GPA to letter grades, courtesy of the Office of the Registrar, http://www.washington.edu/students/gencat/front/Grading_Sys.html, accessed 10 August 2009.

11. In the analysis, the independent variables for majors in architecture and engineering, arts and humanities, business, education, occupational training, and social sciences and a dependent variable of *Wikipedia* usage in our model.

12. The survey question (#13) was stated as follows: "Some students use *Wikipedia*, in one way or another, at some time during their course–related research process. How often do you use *Wikipedia*? Do you ever go to *Wikipedia* during your research process for course–related research, even if your instructor suggests that you should not?"

13. In addition, we found 92 percent (N=1,600) students in our sample reported using *Wikipedia* for obtaining background information when they conducted research for use in their everyday lives. See Alison J. Head and Michael B. Eisenberg, 2009. "Lessons learned: How college students seek information in the digital age," *Project Information Literacy Progress Report* (December 2009), at http://projectinfolit.org/pdfs/PIL_Fall2009_Year1Report_12_2009.pdf, accessed 16 December 2009, p. 16.

14. For a detailed discussion about which resources students use to find information and fulfill certain research contexts, see Alison J. Head and Michael B. Eisenberg, 2009. "Lessons learned: How college students seek information in the digital age," *Project Information Literacy Progress Report* (December 2009), at http://projectinfolit.org/pdfs/PIL_Fall2009_Year1Report_12_2009.pdf, accessed 16 December 2009.

15. In our prior research (2007), a survey was administered on a single campus with a smaller sample (n=178). We found a small amount of respondents (three percent) used *Wikipedia* as their first step in the research process; most used course readings first, see Alison J. Head, 2007. "Beyond Google: How do students conduct academic research?" *First Monday*, volume 12, number 8 (August), at http://firstmonday.org/article/view/1998/1873, accessed 16 December 2009.

16. In our logistic regression analysis, we did not investigate interaction effects between the different variables.

17. The survey question (#7) about using Google was worded so that it was use of Google for finding sites other than *Wikipedia*.

18. The logistic regression model contained five binary independent variables: enrollment in a two–year institution, use of course readings, use of instructors, use of Google, use of librarians, major area of study; 0–absent/1–present and five categorical independent variables for primary area of study/major: architecture and engineering, arts and humanities, business, education, occupational training (*e.g.*, paralegal, radiology technician, dental hygienist, etc.). A variable for the area of study in social sciences was used as the intercept, or as a basis of comparison to other majors.

19. Lee Rainie and Bill Tancer, 2007. "36% of online American adults consult *Wikipedia*; It is particularly popular with the well–educated and current college–age students," *Pew Internet & American Life Project* (April), at http://www.pewinternet.org/Reports/2007/Wikipedia-users.aspx?r=1, accessed 16 December 2009.

20. Sook Lim, 2009. "How and why do college students use *Wikipedia*?" *Journal of the American Society for Information Science and Technology*, volume 60, number 11 (November), pp. 2,189–2,202.

21. In our discussion we define *information utility* broadly to cover the needs, standards and expectations students have for information within the context of course–related research. Previous definitions have defined information utility in terms of Web behavior and ease, convenience, and usefulness of information (Lim, 2009; Rieh and Hillgoss, 2007).

22. Where *Wikipedia's* publishing cycle per entry can take seconds, scholarly cycles, such as *Britannica's*, inevitably take longer. *Wikipedia's crowdsourcing* business model is the underlying mechanism driving its success. *Britannica* would have difficulty (though it has have considered it) competing in this market space, given its staff of paid experts, who write and/or vet content before it appears. See Eric Krangel, 2009. "*Britannica's* doomed plan to take on *Wikipedia*," *Business Insider: Silicon Alley Insider* (22 January), at http://www.businessinsider.com/2009/1/britannicas-doomed-plan-to-take-on-wikipedia, accessed 17 December 2009. For a discussion of crowdsourcing, see Jeff Howe, 2006. "Crowdsourcing: A definition," *Howe's Crowdsourcing blog* (2 June), at http://crowdsourcing.typepad.com/cs/2006/06/crowdsourcing_a.html, accessed 17 December 2009.

23. Lim (2009) also found that "student attitudes toward *Wikipedia* tended to be cautious, as they were aware that it may include inaccurate information, In other words, it seems that students did not use *Wikipedia* blindly," p. 2,200. Sook Lim, 2009. "How and why do college students use *Wikipedia*?" *Journal of the American Society for Information Science and Technology*, volume 60, number 11 (November), pp. 2,189–2,202.

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