Communications in INFORMATION LITERACY

Volume 8, Issue 1, 2014

[ARTICLE]

WIKIPEDIA AND THE WISDOM OF CROWDS

A student project

Greg Barnhisel
Duquesne University

Marcia Rapchak
Duquesne University

ABSTRACT

Students in a senior English class examined the question of whether the 'wisdom of experts' or 'the wisdom of crowds' is more reliable and useful in a writing course by engaging in a parallel Wikipedia project. Each student either created a new entry or made significant changes to an existing Wikipedia entry, tracked changes to their contributions, and then wrote a paper and gave a presentation reflecting on what they learned; simultaneously, the class as a whole collaborated on a Wikipedia entry about a local landmark's controversy. Background readings familiarizing students with Wikipedia's procedures, as well as critical and philosophical interpretations of Wikipedia's significance, provided students perspective on Wikipedia's utility. While the instructor expected students to enter with an uncritical understanding of Wikipedia's reliability and then to see Wikipedia's fundamental untrustworthiness, students' work demonstrated that they entered the class skeptical about Wikipedia and that their projects showed them that Wikipedia was mostly reliable and useful. In this experiment, students showed that they were at an intermediate stage of "personal epistemology" and still had not achieved the level of reflective judgment sought by the school's information-literacy competency goals.

INTRODUCTION

Encouraging students to evaluate information sources not only for their content but also for the context in and for which they are created (author, purpose, audience, etc.) requires advanced critical thinking skills that can only be mastered with time and practice. At Duquesne University, a senior-level writing course taught by the first author, a tenured faculty member in the English Department, attempted to facilitate such evaluation skills through a project in which students created or modified a Wikipedia entry and tracked the modifications made by others to the entry, while they also explored the concept of the 'wisdom of crowds' in contrast to the 'wisdom of experts' through the course readings and discussions. The goal of this assignment was for students to see that, given the crowd-sourced and biased information provided for mass consumption in Wikipedia, expert-created materials would be superior to use for research purposes. However, in student writings, reflections, and interviews about the course designed and conducted by the first author and the second author (a university librarian specializing in information literacy), students indicated that the ease with which Wikipedia satisfices their information needs and their own new understanding of the editing and crowd management of the site made them feel more confident about the usefulness of Wikipedia. The students' responses, particularly their comfort with the contingent nature of Wikipedia and their willingness to dismiss "expert" information, surprised the researchers who expected advanced undergraduate students to identify expert information as superior in most cases. Two possible explanations arise. The students may still be at an intermediate stage of what researchers call "personal epistemology" (Swanson, 2006) and thus the information-literacy curriculum of the university and the English Department should be assessed and improved. Alternately, the researchers themselves, both steeped in an academic epistemology that values credentialed expertise above all, fail to see that Wikipedia's reliance on the "wisdom of crowds" is indeed superior in many respects and that students appreciate that contingency and contextuality better than their instructors.

> FOR GOD'S SAKE, YOU'RE IN COLLEGE; DON'T CITE THE ENCYCLOPEDIA.
>
> JIMMY WALES, WIKIPEDIA

LITERATURE REVIEW

For many instructors, particularly composition instructors, students' use of Wikipedia in class assignments and research papers shows a lack of research skills and little dedication to a project. Both institutions and instructors have banned the use of Wikipedia in college work (Chen, 2010; Jaschik, 2007; Waters, 2007). Wikipedia co-founder Jimmy Wales agrees that students should not use his site for college-level work, stating that when students complain about receiving poor grades for citing (sometimes incorrect) information from Wikipedia, he thinks, "For God's sake, you're in college; don't cite the encyclopedia" (as cited in Young, 2006).

Faculty and librarians alike often bemoan the use of Wikipedia in papers, wishing that students would use library resources instead. Online resources are often blamed for

increases in student plagiarism (Parker, Lenhart, & Moore, 2011) and a White Paper from Turnitin shows that Wikipedia is the number one site with "matched content," which are instances of possible plagiarism or direct quoting on student papers in higher education. Regardless of whether these appearances are plagiarism or not, such frequent use of Wikipedia in writing assignments indicates, at best, unsophisticated research practices. This uncritical reliance on the site has created the edict from many instructors that Wikipedia may not be used in their course, and like an article in the National Post states, many students know that "one of the biggest no-no's" is using Wikipedia as a source in a paper (Boesveld, 2011).

Many people, not just academics, believe that Wikipedia lacks credibility and authority. Several news and blog stories have appeared in the last ten years about errors in Wikipedia (see Fisher, 2005; Pershing, 2009; Seelye, 2005). On Monday July 31, 2006, on *The Colbert Report* (a TV show parodying conservative pundits), host Stephen Colbert coined the term "wikiality," which he defined as a reality that exists through applying "democracy to knowledge" and encouraged his users to tamper with a Wikipedia entry. The same year, *The Onion*, a satirical news source, released a story with the headline "Wikipedia Celebrates 750 Years of Independence," full of laughably false information supposedly gleaned from the site. Aside from the accusations of inaccuracy, which may be overstated, a *New York Times* article notes that entries are frequently poorly written and biased (Levine, 2006).

So are faculty members improving their students' writing by banning the use of Wikipedia? This is unlikely given what Head and Eisenberg (2010) found in their study of over 2,300 undergraduates: "Over half of the survey respondents (52 percent) were frequent Wikipedia users - even if an instructor advised against it." Students will visit Wikipedia regardless of bans from instructors, and after finding Wikipedia a boon in college, 69% of adults with a college degree turn to the source for information which is more than those who do not have a college degree (Zickuhr & Rainie, 2011). However, Head and Eisenberg found that most students in the survey said that they used Wikipedia either at the "very beginning" (40%) or "near the beginning" (30%), which means that many students understand that Wikipedia does not provide comprehensive information on a topic. Over 80% of respondents claimed that they used Wikipedia to find background information and five other resources, including course readings and scholarly research databases, were used more frequently than the collaborative resource for finding background information (Head & Eisenberg, 2010). What librarians and instructors need to do is to show them how correctly to evaluate, analyze, use, and communicate with this tool. By integrating Wikipedia into course projects and activities, instructors can show students the benefits and limitations of the resource.

Several instructors recognize the value of Wikipedia in instruction beyond simple evaluation of entries. By asking students to create entries, instructors empower students and show the value of scholarly communication. Students contribute to a popular pool of information and are writing for an "actual" audience rather than "just the professor," according to writing instructors (Cummings, 2008; Tardy, 2010). In some courses, not only do students write entries, but they find poor entries to revise and add to them substantially while using other

outside resources for support (Cummings, 2008; Pollard, 2008). Students may also be asked to justify and discuss their edits with other Wikipedia users (Cummings, 2008; Pollard, 2008). According to Jim Purdy (2009), "Wikipedia allows for revision based on idea development rather than only grammatical correctness, textual production that involves collaborative participation rather than isolationist thinking, and research based on production rather than mere critique" (W365). This assists in student comprehension of the purpose of revision and the effort that must be dedicated to effective revisions. The use of Wikipedia in higher education assignments has become so popular that there is a Wikipedia entry listing various Wikipedia projects.

Wikipedia's limitations have been discussed exhaustively, yet Wikipedia continues to see more and more use (Zickuhr & Rainie, 2011). Showing students how information is contributed, revised, and argued about on Wikipedia allows them to see the benefits and drawbacks of the "wisdom of crowds" firsthand and involving them in the process through a class assignment brings them closer to understanding the importance of understanding audience and purpose to create a message. However, any composition instructor who includes a Wikipedia project should be forewarned that students, who have most likely been advised against using Wikipedia in the past, may focus much more on its benefits than limitations after the project; this was the experience in the "Ethics, Culture and Writing" course, described in the following sections. And of course, collaborative, constantly evolving "wiki" writing has been employed in writing classes for over fifteen years (Hunter, 2011; Loudermilk-Garza & Hern, 2005; Lundin, 2008;).

Many scholars have examined the deeper question of how undergraduates access, assess, and use information in research projects. Particularly useful for this analysis have been discussions of the process of "developing reflective judgment" in the influential formulation of King and Kitchener (1994). Influenced by King and Kitchener's idea that undergraduates go through "stages" of developing "reflective judgment" about information, Whitmire (2003) and Swanson (2006) both argue that undergraduates begin with an "absolute" model of knowledge in which "knowledge is certain or absolute," pass through a transitional period in which they learn that knowledge can be partially uncertain and then another, relativistic period in which they conclude that "everyone has their own beliefs" Both researchers agree that in the end, students learn that knowledge is contextual and that they must judge the validity of evidence or information by taking its context into consideration.

The Class

The assignment was the culminating project of the senior-level "Ethics, Culture, and Writing" class, one of several capstone classes for English majors offered each semester, taught by the first author of this article. In these "Senior Seminar" capstones, students are expected to demonstrate baccalaureate-level information literacy and communication skills. This particular course, aimed primarily at those students in the "Writing" track of the major, focused on the ethics of public writing. Key issues included:

- What ethical responsibilities does a writer have to his/her readers?
- What ethical responsibilities does a writer have to his/her subject, particularly if that subject is other

people?
- What expectations do readers have of writers in terms of honesty?
- What is the nature of the terms "author" and "authenticity"?
- Which is more reliable, the wisdom of experts, or the wisdom of crowds?

The class' first unit examined what degree of honesty and authenticity American audiences expect from writers in the public sphere. On the syllabus were the cases of *A Million Little Pieces'* author James Frey; *New York Times* plagiarist Jayson Blair; *New Republic* fabricator Stephen Glass; and Nobel laureate and author Rigoberta Menchu. The class read Roland Barthes' "From Work to Text" and Michel Foucault's "What Is an Author?" to provide a theoretical model that questions the naturalness of our ideas of authorship. A second unit examined the responsibility of scholarly authors (particularly ethnographers) to their subjects in three immersion studies: Sudhir Venkatesh's *Gang Leader for a Day* and Philippe Bourgois' *In Search of Respect* (both about the urban criminal underworld) and Rebekah Nathan's *My Freshman Year* (about a professor who goes "undercover" as a first-year student at her large state university).

Taken as a whole, the readings in the first and second unit and the writing assignments accompanying them asked students to reflect on the relationship of an "author," particularly a scholarly author, to the information he or she provides. The French theorists Barthes and Foucault argue that one must detach the person writing from the information included in the "text," with Foucault arguing that the "author-function" is what gives a text "authority," and this author-function does not reside in the individual person writing. The three ethnographies analyze deeply their writers' own dual personae of credentialed scholarly author and individual human being who worries about the ethics of what he/she is doing in the process of generating scholarship. Venkatesh and Bourgois watch and in some cases take part in low-level drug dealing and street violence, and Nathan misrepresents herself to the students she lives with in a university dormitory. The instructor wanted the students to think and write about the nature of the relationship of an individual, human "author" to the information contained in a scholarly study and to see that however much we may want to approach scholarship as objective and impersonal, it is created and shaped by human beings with biases, personal histories, and ethical obligations to their subjects and readers. Moreover, he sought to have the students bring this to bear upon their analysis of Wikipedia, information generated by large groups of anonymous individuals. If an individual author brings bias and slant, he wanted his students to ask the question "Would collectively authored material avoid that problem?"

THE ASSIGNMENT

The Wikipedia assignment was designed as a true "capstone" that would require students to do research in scholarly and general-interest sources, generate an informed response to a broad question, produce a variety of writing projects conveying their response, and present their findings in diverse ways. The basic assignment had three components: 1) a new Wikipedia entry authored by the student or significant alterations/additions to an existing site; 2) an academic paper in which students reported on the process of editing and then watching the subsequent changes

to their chosen entry, and used this evidence to speculate on whether the 'wisdom of crowds' or the 'wisdom of experts' was superior; 3) a five-minute PowerPoint presentation in which they described their findings and conclusions to the class.

Evaluation was based on the following factors (this is taken from the assignment prompt):

- the quality and significance of the additions you make, and how well they demonstrate your understanding of the purpose of an encyclopedia
- the seriousness with which you take the project, including documenting any claims of fact that make it onto the page
- your understanding of the issues surrounding Wikipedia and user-generated content
- the depth of thought and breadth of scope of the final paper
- that your final paper has a central argument and draws upon your own experiences and the ideas of other writers for evidence and context

The overarching goal of the Wikipedia project in all of its various components was for students to evaluate the information available through Wikipedia critically by applying their knowledge—primary and secondary—of how the information on Wikipedia is generated, edited, and presented to the public. Students would then apply this practical knowledge to a theoretical consideration of an epistemological question: whether experts or crowds ultimately produce "better" information ("better" meaning not just more accurate, but also more appropriate for the uses of a specific audience). In their papers, students addressed these questions. Then, for the purposes of this case study, the investigators asked students to return to these questions, two and a half years later, and reflect on how what they learned in that project had affected their use of Wikipedia in their post-college lives.

THE PROJECT

During the weeks that the students worked on their individual Wikipedia projects, the class and instructor also collaboratively authored a brand-new Wikipedia entry and submitted it for publication. They chose a topic, used Wikipedia's templates and entries to determine what sections would need to go in the entry, divided up the task of researching the topic and finding reliable sources to cite in the entry, and eventually wrote the entry collectively.

The entry was on a historic building near Duquesne University called the "Paramount Film Exchange," a decision about whose demolition was then before Pittsburgh City Council. Ultimately, the building was landmarked and saved from demolition. The class composed its entry collaboratively, but the instructor ultimately shaped the article according to Wikipedia's specifications and then, over the course of several days, repeatedly returned to the article to edit and proofread it. The last edit the instructor made to the article was in January 2010 to note the Council's decision to landmark the building. Over the subsequent two year period several other Wikipedia contributors have added details to the article, catalogued it better within Wikipedia's indexing system, and further edited the page. The revision's history page shows these additions and edits.

Creating an entry as a class—and spending in-class time on the project when a

computer classroom was available—served a practical pedagogical purpose: this way students all knew how to create a Wikipedia account, start a new entry, learn the very basic HTML tags and the conventions of the site. The collaborative "authorship" of the site, moreover, served as fodder for discussions about the nature of authorship (meshing nicely with the Foucault reading) and as an object lesson about how 'the wisdom of crowds' looked in operation, as neither the students nor the instructor were experts in urban preservation or neighborhood history. Does it matter, the class wondered, whether a group of laypeople with no credentials in any relevant field were producing the most widely disseminated and long-lasting account of this local political controversy? What key aspects of this story were we missing because of our lack of training or knowledge?

METHODOLOGY

For the purposes of this study, the investigators initially applied for IRB approval and received that approval in Spring 2012. The investigators then attempted to contact all members of the ENG 450W class (all of whom graduated in Spring 2010). Five of the nine students who completed the class responded and agreed to take part in the study. Two of these were also able to take part in a filmed interview; the rest could only participate by filling out a survey. All participants signed a consent form and the two students who agreed to be filmed came in on separate days to answer questions on camera. The remaining three students sent their answers to the study questions via email.

All students who consented to take part in the study consented to make their final papers available; they are included as supplemental files. The students are referred to as Student 1, Student 2, Student 3, Student 4, and Student 5 in the text.

INSTRUCTOR PRECONCEPTIONS AND STUDENT RESPONSES

The instructor came into this class, and into the Wikipedia project in particular, with a very strong preconception (derived both from cultural stereotyping and from many years of teaching freshman writing) that college students credulously believe everything they read on Wikipedia and either do not or cannot differentiate its validity as a source from the validity or credibility of a scholarly source.

This preconception determined the approach to teaching the material in class. Assuming correctly that students were unfamiliar with how Wikipedia pages were created and edited, the instructor assigned students to read several articles on the early history of Wikipedia (including excerpts from Andrew Lih's *The Wikipedia Revolution*) and the "nuts and bolts" of creating and editing Wikipedia pages (Lih ,2009). Perhaps the most interesting of these articles was Katherine Mangu-Ward's (2007) piece from the libertarian magazine *Reason*, in which she highlights Wikipedia founder Jimmy Wales' libertarian philosophy and how Wikipedia is itself an appealing model of how the market (Wikipedia contributors and volunteer editors) can satisfy the needs of the people (web surfers looking for information) and that the value of this product (information) is best determined by the marketplace (Mangu-Ward, 2007). While her argument is flawed, it did provide students with a model of someone doing genuine cultural-studies work on Wikipedia, even if the political stance of the cultural-studies work was very different than that of the founders of cultural studies, but not from

those of the founders of Wikipedia.

Pressed on how Wikipedia colors their understanding of the question of the wisdom of crowds, the class as a whole quickly concluded that pages were much more likely to be accurate and useful if they were popular or consulted often. Conversely, they quickly saw that rarely viewed pages could carry false or incomplete information for months. Wikipedia, they decided, was much more useful for information about "hot topics" or perennial sources of interest, whereas one would be much better served looking for information on arcane or obscure topics in publications aimed at specialists and authored by experts in those fields. This conclusion showed a high "epistemological development level" (Whitmire, 2003) in that students identified that knowledge is contextual.

Students' Assessment of Wikipedia in Their Papers

In their final papers, students tended to concentrate less on the philosophical issues of the free market or of experts versus the crowd than on more pragmatic concerns. "What are Wikipedia pages good for?" they asked and answered. Pointing out that Wikipedia pages are important marketing and promotional tools for companies, organizations, politicians, and artists, and that users should keep this in mind when using these pages, in one class period the instructor inserted a defamatory falsehood into the page of Luke Ravenstahl, the mayor of Pittsburgh at the time, and asked students to see how long it took the falsehood to disappear. Within five minutes, it was gone. This suggests, the instructor pointed out, that policing one's own Wikipedia page has become a priority for those who are in the business of promotion. (One student took off with that idea and used his final project to create a Wikipedia page that would promote his brother's medical-device business.)

What students wrote in their papers illustrates this equivocal, pragmatic understanding of Wikipedia. Student 1—whose contribution was a new article on Maryland's Bull Run Invitational Cross Country Race—wrote that:

> I can support neither the notion of superiority in "the wisdom of the crowds" or the "expert." I would argue that both are equally capable of fault…. My own Wikipedia article, "The Bull Run Invitational Cross Country Race" further proves that in Wikipedia the wisdom of the crowds stand equal with the wisdom of the expert.

Student 4 focused his Wikipedia experiment even more:

> I have created an entry with a specific commercial agenda which directly challenges the functionality of Wikipedia's anarchic approach to knowledge. My article seeks to promote a specific company, Accord Curtains, and it is purposefully manipulative. Still, the greater question remains, will my discretely non-NPOV (neutral point of view) article actually persuade anyone? Furthermore, just because my biased article has stayed in the Wikipedia database for about a month, does it amount to any substantial argument against the viability of the wisdom of crowds?

Student 2 also created a new entry on the 1871 Supreme Court decision *Collector v.*

Day. While Student 1 and Student 4 previously quoted created entries on topics that were arguably of little public interest, Student 2's entry is of much more potential use to a broader audience. (Interestingly, though, although Wikipedia doesn't provide a count of hits to help judge the popularity of an entry, Student 2's entry has received a similar number of edits in the last two and a half years as have Student 4 and Student 1's.) In her paper, Student 2 directly addressed the nature of expertise and the seeming arbitrariness of how the qualification "expert" is bestowed upon people:

> Experts are no longer the sole providers of information, but instead a twenty-two year old from Pittsburgh, Pennsylvania, can pose as an expert on a constitutional law case with the right materials. This made me question: What qualifies someone to be an expert? Do a couple of more years of education and a Ph.D. really make someone more qualified than the average person? What if a person reads multiple books on a subject? Or what if another person has experienced something so many times that it becomes a second nature to him or her? Shouldn't that qualify the person as an expert? I think so. Especially if the materials needed to write an article are cited, it shows that the person creating it has a solid idea of the subject matter. The elitist should not be so quick to judge those of us who [are] unable to achieve "expert status" according to their standards. From my experience alone, I feel that I have beome [sic] an expert on my topic because of all the work I have put into it. After all, isn't that what it takes to become an expert—an immense amount of work on a particular subject?

Student 5 tested the reliability of Wikipedia with a more mischievous approach; he inserted lies and invective into a long entry for the wildly popular football simulation video game Madden 10:

> Often when playing and making a crucial mistake, I would be greeted by in game commenter Cris Collinsworth's voice telling me how awful a decision my interception was. I finally enacted revenge on him by posting vicious hearsays on Wikipedia, as I thought it would be interesting to talk about in the history of the page. However, the lies I put up stuck... Other members of the Wiki community who posted material to the page did nothing to counteract my lying. No administrator swooped in to remove it; it just stuck.

Student 5 was surprised at how long it took for other users to notice his "lies," given the popularity of the game.

> I posted most of the actual text between November 30th and December 2nd, with most of the lies coming at the end of my foray into Wikipedia editing. These lies were not taken down until the ninth of December…. In fact, users actually cleaned up the text I had produced two days before the lies were taken down by two different sources.

Student Responses to the Project

Five students provided written or in-person filmed responses to a set of questions the

two researchers generated. Two and a half years after completing the class, when asked to reflect on what they learned about Wikipedia through this assignment, students barely altered their original summative judgments that had so completely countered the instructor's preconceptions. Perhaps because of a required one-credit information -literacy course they took as first-year students, the students who responded to the questionnaire for this study reported that they came into the class convinced that Wikipedia was an *unreliable source* but that learning about the creation and community editing of Wikipedia pages made the site *more reliable* to them.

Student 4 and Student 5, who agreed to be interviewed on camera for this project, address this question directly in the interviews. Three other students who could not be present for an on-camera interview agreed. Student 2 notes that before the class:

> I knew that Wikipedia was a website that could tell you about anything and everything; however, I also believed (and was told by my teachers) that Wikipedia was not a reliable source. I would use it for a random question that I would have throughout the day to store in my "useless facts file," but I would never use it to write a paper.

The class, however, changed her mind:

> I learned that the power of the masses is a real thing. I remember [the professor] told us to play around with the website and "get to know it." I did just that. I remember one Thursday night, while watching the Steelers' game, I deleted all of the text under Troy Polamalu's "Professional Career" and just wrote, "Troy Polamalu has the sexiest hair in the NFL." Not even 5 seconds later, I had a message from a Wikipedia policeman informing me about the repercussions of doing such a thing to a Wikipage...It really opened my eyes as to how incredible and powerful the internet is to society.

Student 3 in the class reports much the same impressions, noting that her impression of Wikipedia prior to this class was "not positive" because "its information verification parameters were not incredibly strict." But like Student 2, her opinion changed:

> During class, I answered the question, "What is more reliable, the wisdom of experts, or the wisdom of crowds?" by arguing that crowd contribution, like that on Wikipedia, far surpasses the reliability of experts. My work with the Wikipedia page helped me answer that question because I found that a diversity of opinion, independence in thought, decentralization of knowledge, and aggregation that separate wise contributions from irrational ones truly inform the "truth" that we know and accept, as opposed to one "fact-checked expert" who may report incorrect information to the masses. (How often are mainstream media reports wrong?)

Student 1 came to much the same conclusion:

> Before [this] class, I knew little about the workings of Wikipedia [and] I never used it for academic research as I had long been told by

> teachers and professors that Wikipedia was not a proper research tool. [In the course of the class] I think I became more open to Wikipedia... While Wikipedia lacks the traditional safeguards that guarantee reliability in other resources, it is still capable of producing expert level articles.

And like the others, Student 1 exhibits a fundamentally pragmatic approach to the collection and use of information:

> Both sources [crowds and experts] have different merits... My life experience since class pulls me in favor of the wisdom of the crowd. In my recent studies, I have found that I can learn much more from a group of my peers than from a single expert.

Striking in many of these students' responses is their certainty that laypeople such as themselves can generate information that is just as valid and useful as that which scholars or credentialed experts might provide. Why does one need a Ph.D. to talk about the Bull Run Invitational Cross-Country Meet or Madden 17? In fact, might scholarly credentials undermine one's ability to provide useful information to a general audience? The rapidity with which intentionally inserted errors were corrected confirmed to students that Wikipedia's self-policing works. The authors agree with the students here. Where the students show their naïveté—and thus where the information-literacy curriculum of the university and the department have fallen short—is that they *generalize* this conclusion. If crowds are good enough to tell me about Madden 17, why aren't they good enough for everything? Certainly there must be enough laypeople who have read enough books about any given topic to assure readers that the corresponding Wikipedia entry is fine, these students sanguinely suggest.

What comes out forcefully in this study, finally, is that the university has successfully helped its students move past the most preliminary levels of personal epistemology (received facts are unquestioned), past the transitional relativistic stage (everything is just an opinion; nothing is a fact) and into the "contextual" final stage. Where the curriculum has failed is in providing students with a full understanding of the categorical difference between knowledge generated by experts and certified as valid through the customary procedures of peer review, expert editing, and such, and knowledge generated by well-informed laypeople. They don't, in short, truly understand the "context" in which scholarly information is generated, and thus they cannot be said to be making fully informed information-seeking judgments.

CONCLUSION

The instructor came into the unit assuming that he would be ushering students into an epiphany: Wikipedia, a source they loved and relied upon and rarely questioned, was actually rife with junk information because anyone—even they—could change anything at will, and the only mechanism that Wikipedia employed to guard its reliability on the vast majority of pages was the chance that someone else would spot and take the time to correct the false information. While the wisdom of experts should never be taken uncritically and must always be understood in context, the instructor hoped to show them that experts could be relied upon at least to provide factual, accurate, and generally comprehensive information about a topic. In addition, experts could be trusted to put this information into a format lay

users could easily access and understand, with the most important points highlighted and conceptual connections emphasized. Crowd-generated wisdom, on the other hand, was unreliable, hit-and-miss, and most of all subject to faddishness and the fact that fanatics and ideologues are the ones most likely to take the time to write and edit pages.

How this failed! The students took away the pragmatic lesson that Wikipedia was generally reliable, almost always useful, and that its self-policing mechanisms were mostly effective, particularly when it came to popular or especially controversial pages. In fact, as Student 3 stated above, a credentialed, "fact-checked" expert may be wrong, as frequently erroneous "media reports" show us. Underpinning this is the vast philosophical divide between someone in the professionalized, credentialed "knowledge industry" like the instructor, and someone preparing for a life and career where absolute truth, absolute credibility, and absolute reliability are illusory, and knowing what is "good enough"—and when and how one uses that—is key. None of these students was seeking (or has entered) careers in academia or research, and thus the problems of generating and validating knowledge may have seemed esoteric and irrelevant to them. They may naturally feel that "good enough for now" information is good enough. However, Allison Head (2012), the lead researcher for Project Information Literacy, found that employers were dissatisfied with recent college hires' research skills because of this tendency to satisfice for quick and easy answers; if employees want persistent researchers willing to dig deeply to find the best sources, then academic research may not be as dissimilar to "real-world" research as students anticipate.

Although in many ways they evidenced advanced epistemological development (in that they understand that knowledge is contextual, and they are able to identify the contexts and determining factors they would use in assessing information), students also demonstrated a lack of understanding about the nature of knowledge among scholars. Student 2 asked "Does a couple of more years of education and a Ph.D. really make someone more qualified than the average person? What if a person reads multiple books on a subject? Or what if another person has experienced something so many times that it becomes a second nature to him or her?" Certainly, practical and empirical knowledge is useful and can be superior in some contexts. However, this student and others failed to show an understanding that credentials (such as a Ph.D.) do not come from simply "reading multiple books on a subject," that scholars must have their own contentions and conclusions vetted by other specialists in a field before publishing. The authors of this article suspect that such a misunderstanding of how scholars and researchers generate, verify, and disseminate knowledge may underlie such cultural phenomena as global-warming denial or the belief that vaccines cause autism. The students seemed to imply that the only thing differentiating scholars' information from laypeople's is that scholars have read a few more books and sat through some classes.

The expectation was not that students would avoid Wikipedia after participating in the project, but that they would approach Wikipedia with an understanding of the circumstances under which it would be appropriate to use. Wikipedia may never be objectively reliable because there is no formalized process in which credentialed experts oversee the content, but its more popular pages are more likely to be reliable

because the "crowd" will filter out blatant inaccuracies and misinformation. Thus, the intent was to make students aware of the differing information needs that would or would not warrant using Wikipedia.

This qualified failure may speak to some of the difficulties of teaching information literacy at the postsecondary level. The Middle States Commission on Higher Education evaluates member schools on how they teach information literacy, and Duquesne University requires a single, one-credit, stand-alone information literacy course taught in the first semester to meet those requirements. Essentially all of the nine undergraduate colleges, though, also embed information literacy in each of their majors as well, and this is true for the English major. While this class was a capstone course for the English major, embedded in the class' guidelines were information-literacy competencies, particularly the ability to find, understand, evaluate, and use various kinds of information that Standard Three of the ACRL's Information Literacy Competencies describes.

In grappling with Standard One's performance indicator of "identifying the purpose and audience of potential resources" and Standard Three's performance indicator of "recognizing the cultural, physical, or other context within which the information was created and understanding the impact of context on interpreting the information," students focused too heavily on the fact that *some* contributors to Wikipedia were indeed experts and *some* contributors were energetic and heavily invested in the site, whether disinterestedly or not. Because there are legitimate experts contributing to Wikipedia sites, because crowds can genuinely be better and more accurate sources than individuals, and because many Wikipedia editors and writers are active in maintaining the site, the students reasoned that Wikipedia is much more reliable than they had previously believed. By undermining the simple Manichean formula that they had taken—not entirely justifiably—from the first-year information-literacy class (Wikipedia = bad, scholarly = good), this assignment inadvertently opened the door to another form of naïveté and bias in which students mistake *investment in* a set of information or data for *unbiased expertise in* that set of information. Ironically, an assignment intended to make students more skeptical of Wikipedia ended up accomplishing precisely the opposite. In this case, the instructor largely succeeded in teaching *critical reception and analysis* of a source—that is, the students demonstrated their understanding of Wikipedia's drawbacks and strengths—but that didn't necessarily translate into successfully training students to *using that source appropriately in their own research and writing*. Such skills are surprisingly detachable and thus instructors may need to plan accordingly.

It is important to note that this project is only a small case study, without any rigorous longitudinal benchmarking, control groups, large body of data, or pre- and post-tests. Moreover, the data set is quite small; only five students were able to take part in the follow-up study. Therefore, the conclusions reached by the investigators should be viewed as suggestive, not dispositive. Nonetheless, they are a small indicator of larger trends related to Millennials' information literacy that more comprehensive studies and general-interest journalism alike have identified: a skepticism about uncritical acceptance of credentialed expertise, a willingness to accept information from uncredentialed

sources, and an openness to "crowdsourcing" that may promise the more democratic or even egalitarian information environment that Internet utopians and optimists predict or may, as Maggie Jackson warns, portend a "coming dark age" (Jackson, 2009).

REFERENCES

Association of College and Research Libraries (2000). *Information literacy competency standards for higher education*. Retrieved from http://www.ala.org/acrl/standards/informationliteracycompetency

Boesveld, S. (2011, May 30). Can Wikipedia improve students' work? *National Post*. Retrieved from http://news.nationalpost.com/2011/05/30/can-wikipedia-improve-students-work/

Chen, H. (2010). The perspectives of higher education faculty on Wikipedia. *Electronic Library*, *28*(3), 361–373. doi: 10.1108/02640471011051954

Cummings, R. E. (2009). *Lazy virtues. Teaching writing in the age of Wikipedia*. Nashville, TN: Vanderbilt University Press.

Fisher, K. (2005, December 11). Wikipedia hoaxster [sic] found, but a solution for Wikipedia is still lacking. *Ars Technica*. Retrieved from http://arstechnica.com/uncategorized/2005/12/5739-2/

Head, A. (2012). Learning curve: How college graduates solve information problems once they join the workplace. doi: 10.2139/ssrn.2165031

Head, A. J., & Eisenberg, M. B. (2010). How today's college students use Wikipedia for course-related research. *First Monday*, *15*(3), 1-1. doi: 10.5210/fm.v15i3.2830

Hunter, R. (2011, March). Erasing "property lines": A collaborative notion of authorship and textual ownership on a fan wiki. *Computers and Composition*, *28*(1), 40–56. doi: 10.1016/j.compcom.2010.12.004

Jaschik, S. (2007, January 26). A stand against Wikipedia. *Inside Higher Ed*. Retrieved from http://www.insidehighered.com/news/2007/01/26/wiki

Jackson, M. (2009). *Distracted: The erosion of attention and the coming Dark Age*. Amherst, MA: Prometheus Books.

King, P., & Kitchener, K. (1994). *Developing reflective judgment: Understanding and promoting intellectual growth and critical thinking in adolescents and adults.* San Francisco: Jossey-Bass.

Levine, R. (2006, August 7). The many voices of Wikipedia, heard in one place. *The New York Times*. Retrieved from http://www.nytimes.com/2006/08/07/technology/07wiki.html

Lih, A. (2009). *The Wikipedia revolution: How a bunch of nobodies created the world's greatest encyclopedia.* New York: Hyperion.

Loudermilk-Garza, S., & Hern, T. (2012, October 19). "Collaborative writing tools: Something wiki this way comes-or not!" *KAIROS*, *10*(1). Retrieved from http://english.ttu.edu/kairos/10.1/binder2.html?http://falcon.tamucc.edu/wiki/WikiArticle/Home

Lundin, R. W. (2008). Teaching with wikis: Toward a networked pedagogy. *Computers and Composition 25*(4), 432–448. doi: 10.1016/j.comcom/2008.06.001

Mangu-Ward, K. (2007, June). Wikipedia and beyond: Jimmy Wales' sprawling vision. *Reason*, *39*(2). Retrieved from http://reason.com/archives/2007/05/30/wikipedia-and-beyond

Parker, K., Lenhart, A., & Moore, K. (2011, August 28). The digital revolution and higher education. Pew Internet and American Life Project. Retrieved from http://pewinternet.org/Reports/2011/College-presidents.aspx

Pershing, B. (2009, January 21). Kennedy, Byrd the latest victims of Wikipedia errors. Capitol briefing [Blog]. *The Washington Post*. Retrieved from http://voices.washingtonpost.com/capitol-briefing/2009/01/kennedy_the_latest_victim_of_w.html

Pollard, E. A. (2008). Raising the stakes: Writing about witchcraft on Wikipedia. *The History Teacher*, *42*(1), 9–24. Retrieved from http://www.historycooperative.org/journals/ht/42.1/pollard.html

Purdy, J. P. (2009). When the tenets of composition go public: A study of writing in Wikipedia. *College Composition and Communication*, *61*(2), W351-W373. Retrieved from http://www.ncte.org/library/NCTEFiles/Resources/Journals/CCC/0612-dec09/CCC0612When.pdf

Seelye, K. Q. (2005, December 4). Snared in the web of a Wikipedia liar. *The New York Times*. Retrieved from http://www.nytimes.com/2005/12/04/weekinreview/04seelye.html?pagewanted=all

Swanson, T. (2006). Information literacy, personal epistemology, and knowledge construction: Potential and possibilities. *College and Undergraduate Libraries*, *13*(3), 93–112. doi:10.1300/J106v13n03-07

Tardy, C. M. (2010) Writing for the world: Wikipedia as an introduction to academic writing. *English Teaching FORUM*, *48*(1), 12–19, 27. Retrieved from http://www.eric.ed.gov/PDFS/EJ914884.pdf

Turnitin. (2011). Plagiarism and the web: A comparison of Internet sources for secondary and higher education students [White Paper].

Wikipedia celebrates 750 years of American independence. (2006, July 26). *The Onion*. Retrieved from http://www.theonion.com/articles/wikipedia-celebrates-750-years-of-american-indepen,2007/

Waters, N. L. (2007). Why you can't cite Wikipedia in my class. *Communications of the ACM*, *50*(9), 15-–17. Retrieved from http://dl.acm.org/citation.cfm?id=1284635

Whitmire, E. (2003). Epistemological beliefs and the information-seeking behavior of undergraduates. *Library and Information Science Research*, *25*(2), 127–142. doi: 10.1016/S0740-8188(03)00003-3

Young, J. R. (2006, June 12). Wikipedia founder discourages academic use of his creation. [Wired Campus blog]. *The Chronicle of Higher Education*. Retrieved from http://chronicle.com/blogs/wiredcampus/wikipedia-founder-discourages-academic-use-of-his-creation/2305

Zickuhr, K., & Rainie, L. (2011, January 13). Wikipedia, past and present. Pew Internet and American Life Project. Retrieved from http://pewinternet.org/Reports/2011/Wikipedia.aspx