

# Teaching Wikipedia: Supporting Students in Lifelong Learning

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**Abstract:** While Wikipedia is used by students for both in- and out-of-school learning, teachers often warn students against using Wikipedia as a reliable source for research. Students may not be adequately prepared to use the site as a starting point for research and to judge the quality of articles within it. We present findings from a secondary classroom intervention study designed to teach learners how to evaluate online information. Findings suggest that when teachers discussed the usefulness of Wikipedia as a site to begin research and presented Wikipedia's standards and processes for improving the reliability of articles, students were more likely to choose the page over a questionable website disguised by artificially trustworthy surface features. Our findings contribute to the information search and online reasoning literatures addressing how to prepare learners to critically examine the reliability of online information.

## Introduction and literature

Wikipedia presents an instructional paradox: the website is highly used by secondary students but often maligned in secondary classrooms. On one hand, students report that they use Wikipedia for academic research (Blikstad-Balas, 2016) and to access links to reliable sources (Polk, Johnston, & Evers, 2015). They may turn to Wikipedia because of its accessibility: in one study, students listed the ease of accessing information on Wikipedia as one of its key advantages, and 99% agreed that it is easy to find information on the site (Blikstad-Balas, 2016). On the other hand, high school students are often taught not to use Wikipedia for academic work (e.g., Garrison, 2015; Polk et al., 2015) and worry that their teachers will criticize their use of the source (Mothe & Sahut, 2018). Furthermore, students share the concerns about Wikipedia's reliability that drive their teachers to set policies against it. The same students who valued Wikipedia's accessibility also overwhelmingly agreed with the statement that "Information on Wikipedia might be wrong" (Blikstad-Balas, 2016).

These credibility concerns are rooted in fact. Wikipedia itself identifies as "not a reliable source" and warns readers against using articles as definitive sources because they can be edited and thus are vulnerable to vandalism, represent "a work in progress," or may be "just plain wrong" ("Wikipedia:Wikipedia is not a reliable source," n.d.). Still, Wikipedia has standards and processes in place to improve the quality and dependability of its articles. Articles should represent a neutral point of view and cite reliable, published sources to back claims. Processes such as levels of locked pages and page warnings when articles do not meet standards are intended to help readers more easily judge the quality of a Wikipedia article ("Wikipedia:List of policies," n.d.).

Instead of avoiding Wikipedia, experts on Internet search and evaluation have been found to use Wikipedia and its references as a starting point in research (Wineburg & McGrew, 2019) and rely on markers built into the site (e.g., history and talk pages, warnings, references) to determine the variable quality of the content (Forte et al., 2014). Thus, experts view Wikipedia as a launch pad and understand that they can navigate it more effectively with knowledge of Wikipedia's standards and processes. Teachers might aim to help secondary students develop similar knowledge of and approaches to using Wikipedia. Instead of labeling the site as wholly unreliable and prohibiting its use, teachers could help students learn to strategically use Wikipedia and to develop more sophisticated approaches to judging the credibility of articles within it (Konieczny, 2016; Lim, 2013).

This study focused on students' learning after two lessons that were designed to teach such an approach to Wikipedia. Using pre- and posttest data drawn from an intervention study that aimed to teach students to evaluate online information, this study investigated the question, How do lessons on strategic use of Wikipedia affect high school learners' evaluations of a Wikipedia article?

## Method

Data were drawn from a larger intervention study to teach high school students to evaluate online information. Over the course of one semester, participating teachers taught six lessons on evaluating digital content that were previously developed, piloted, and tested (McGrew, 2020; see [cor.stanford.edu](http://cor.stanford.edu) for full curriculum from which the lessons were drawn). Before they taught the lessons, teachers participated in a day-long professional development workshop that introduced the strategies for evaluating information used in the lessons and allowed teachers and researchers to collaborate on modifications to the lessons. Additionally, the teachers and a researcher met three times during the semester to discuss the lessons they had taught so far and preview upcoming lessons.

## Teaching Wikipedia

Two of the six lessons addressed Wikipedia. They were designed to counter potential misconceptions about the site (e.g., it is completely unreliable because anyone can edit it) and teach students to strategically use Wikipedia articles as they searched for and evaluated online information. The first lesson introduced students to Wikipedia as one of several sources they could use when reading laterally (i.e., researching the source of a website by leaving the site and using additional online resources; Wineburg & McGrew, 2019). Teachers acknowledged that students may have learned not to use Wikipedia in the past but countered that it could be a powerful resource if students learned to use it well. Students learned about Wikipedia's standard of verifiability and practiced checking citations and investigating references for a claim. At the beginning of the second lesson that addressed Wikipedia, students reviewed Wikipedia's standards of neutral point of view and verifiability and were introduced to the processes in place to enforce these standards and flag articles that do not meet them. Teachers modeled how to begin the process of researching a claim on Wikipedia, first by gaining background information on the topic and then by following up on a claim within Wikipedia to check the quality and consistency of the references. Students worked in groups to practice checking additional claims using Wikipedia and discussed how they used Wikipedia.

## Data Collection

Students completed online pre- and posttests one week before the first lesson in the six-lesson series and one week after the final lesson. Students worked individually on Internet-connected school computers and completed each task by typing answers to written prompts. Both pre- and posttests included five brief, constructed-response items. Parallel forms of previously validated items (McGrew et al., 2018) were developed to create two test forms that differed only in the content they asked students to evaluate. Forms were randomly assigned to class periods for the pretest and students completed the alternate form for the posttest.

This study focused on responses to a task that assessed students' evaluations of a Wikipedia article. Students were asked to imagine that they were researching a policy topic (gun control or animal testing) and found two webpages, both of which were linked in the task. Students were told to visit both sites and then asked, "Which of these two webpages do you think is a better place to start your research? Explain your choice. Refer to both webpages in your answer." In both test forms, the two websites choices were (1) a Wikipedia page on the topic; and (2) a university-based website (with a .edu top-level domain) that did not present a scholarly view from professors at the university. The article on gun control was a re-printed National Rifle Association pamphlet on "Myths about Gun Control" posted on a personal page within duke.edu, while the article on animal testing was a student's model persuasive essay that appeared on the English Department website on lonestar.edu.

## Participants

The study was based in a comprehensive high school in a small city on the West Coast of the U.S. In the 2018-19 school year, the student body of the high school was 3% Filipino, 90% Latinx, and 5% white. Twenty-three percent of students were classified as English learners and 62% were eligible for free or reduced lunch. Six teachers, all of whom taught tenth- or eleventh-grade social studies courses, participated. Teachers ranged from being in their first to their 21st year of teaching ( $M = 7$ ;  $SD = 7.6$ ). Students in these teachers' classes who completed both the pre- and posttest were included in the sample ( $n = 439$ ).

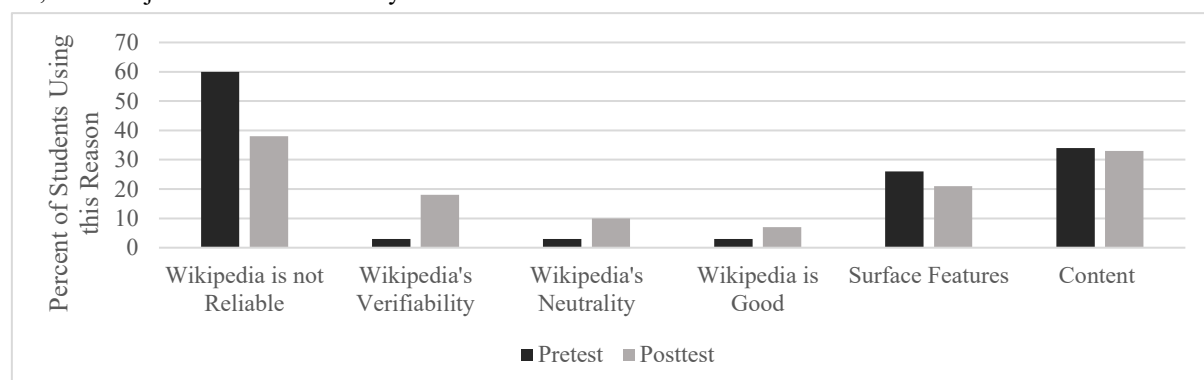
## Analysis

Two raters analyzed a subset of responses and drafted an initial coding scheme to capture the evaluation strategies that students described using (e.g., amount of information, URL, or knowledge of source). Codes were added and refined to fully represent the range of student reasoning and all student responses were coded using that scheme. Multiple codes were applied to a response if students described multiple approaches or reasons. Both raters coded all remaining responses; interrater reliability was 93%. The codes were then analyzed to describe the most common approaches to evaluating Wikipedia and how, if at all, students' reasoning changed from pre- to posttest.

## Findings

From pretest to posttest, there was a 100% increase in the percent of students who selected the Wikipedia article as the better place to begin research. On the pretest, 24% of students selected the Wikipedia article; on the posttest, 49% did. A McNemar binary matched-pairs test provided evidence that a significantly higher proportion of students selected Wikipedia on the post-test (Exact  $p < .001$ ). Students' rationale for their website choice shifted substantially from pre- to posttest in ways that aligned with the goals of the lessons (see Figure 1). On the pretest, 60% of students reasoned that Wikipedia is not a reliable source. These students argued that the fact that anyone can edit the site makes it difficult to trust. For example, one student wrote, "I believe that website A [the .edu site]

is a better place to start researching. I believe this because, in Wikipedia, anyone can post in what they believe in. In other words, not all the information may be true.” On the posttest, only 38% of students wrote responses like this, which rejected the site as wholly unreliable.



**Figure 1.** Rationale for Site Selection.

As global distrust of Wikipedia declined, the prevalence of responses with specific reasons to use Wikipedia as a starting point for research increased. On the pretest, just 3% of students indicated selecting Wikipedia due to each of the following reasons: its verifiability (i.e., Wikipedia articles should provide citations to reliable sources for its claims, which makes it possible to find more reliable sources), neutrality (i.e., Wikipedia articles should present an overview and arguments on all sides of an issue, not just one side), or because it was a familiar or good website with which to start research. On the posttest, 18% of student responses reasoned that Wikipedia was verifiable, 10% argued that it represented a more neutral take on the topic than the other article, and 7% said it was a better starting point (see Table 1 for sample student responses in these categories).

**Table 1:** Students’ Written Reasons for Starting with Wikipedia

Reason Provided for Selecting Wikipedia	Example Student Response
Verifiability	“[Wikipedia] will allow me to gain an understanding of the subject before looking for sites that I may not know are reliable. Wiki will help me by also linking to sites where they find their information that I could use.”
Neutrality	“The Wikipedia page provides what both ‘Gun Rights’ and ‘Gun Control’ activists believe and why they believe it. While the other page has one opinion on guns.”
Good Website	“Wikipedia is a good source to start and get general information. Although Wikipedia has a reputation for being unreliable, it is a good place to find general information and history. However, Wikipedia should not be the only source and the information should be further researched to make sure the information is accurate.”

Some reasoning remained stable from pre- to posttest. For example, students explained that their choice was based on the presence of easy-to-manipulate surface features of the site like its top-level domain (.org or .edu) or appearance. Students also compared or engaged with the content of the sites, commenting on the amount of information or offering their opinion on the topic. This reasoning, however, had little to do with Wikipedia.

## Discussion

Available evidence suggests that many teachers discourage or even ban students from using Wikipedia for school-related tasks (e.g., Blikstad-Balas, 2016; Polk et al., 2015). Pretest responses suggest that many students adopted this message about Wikipedia’s questionable reliability. However, a modest intervention showed evidence of changing students’ expressed views on the usefulness of a Wikipedia article. After the lessons, fewer students issued wholesale rejections of Wikipedia and more offered accurate rationales for using the site as a starting point in research. The written student responses do not offer insight into whether students’ views on Wikipedia actually shifted, or whether students felt more comfortable voicing their true feelings about the site after a teacher expressed approval (in certain conditions) of it. However, the fact that students’ reasons for selecting Wikipedia aligned with the reasons introduced in the intervention lessons suggests that the lessons had an effect. Students did not simply favor Wikipedia because of its accessibility, as other studies have found (e.g., Blikstad-Bilas, 2016). Instead, students showed evidence of developing the approach to Wikipedia that expert web users deploy.

Although students' views of Wikipedia's usefulness showed evidence of shifting, many students still did not select the Wikipedia article and reported using less effective approaches, such as judging websites based on surface features or solely on contents. These approaches mirror findings in other studies on students' evaluations of online information (e.g., Barzilai & Zohar, 2012; McGrew et al., 2018) and suggest that students need more support to continue to progress in their ability to evaluate online information.

The initial, positive findings reported here lay the groundwork for future research. Future studies should use varied measures of students' views on and approaches to evaluating Wikipedia. For example, tasks could assess whether students actually engage in verifying claims with Wikipedia and tap how students use the site outside of formal school environments. Further, interviews or reflection questions could probe the source of students' views on Wikipedia. Finally, future work could explore students' pathways of reasoning about Wikipedia, exploring how students move from novice to more sophisticated evaluations.

## Conclusion

Our findings contribute to a growing body of research on how to support students to effectively seek and evaluate online information. This study suggests that there is promise in investigating principles for designing instruction that helps students learn to make nuanced, context-dependent assessments of content within Wikipedia instead of teaching them to avoid it all together. If students learn strategies for using Wikipedia wisely, there is potential to better prepare them for out-of-school and lifelong learning, where Wikipedia is an often-present resource.

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