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## Wikipedia editing and information literacy: A case study

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# Wikipedia editing and information literacy: a case study

## Abstract

**Purpose:** This paper evaluates the success of a Wikipedia editing assessment designed to improve the information literacy skills of a cohort of first-year undergraduate Health Sciences students.

**Design:** In this Action Research case study (known hereafter as “the project” to differentiate this Action Research from the students’ own research), students researched, wrote and published Wikipedia articles on Australia-centric health topics. Students were given a pre- and post-test to assess levels of self-confidence in finding, evaluating and referencing information. Student work was also analysed in terms of article length and quantity and the type of information sources used.

**Findings:** Tests revealed that students’ self-confidence in their information literacy skills improved overall. Analysis of student work revealed that students wrote longer articles and incorporated more references than expected. References used were of appropriate quality relevant to the article despite minimal instructions.

**Originality/Value:** There are few studies that investigate information literacy development through Wikipedia editing in Australian universities. This study shows that Wikipedia editing is an effective way to carry out a student assessment prior to essay writing and an innovative platform through which to improve information literacy skills among undergraduate students.

## Rationale

The School of Health Sciences at The University of Notre Dame, Australia (Notre Dame) offers courses in Health and Physical Education, Preventative Health, Outdoor Recreation, Exercise and Sports Science, and Biomedical Science. As a result, the first-year communications unit, “Academic Research and Writing in the Health Sciences” (unit code CO115) contains a diverse student group. The student body mostly consists of younger students undertaking their first semester of study at university. The CO115 unit has a unique position in the School of Health Sciences as the Health Sciences Librarian (HSL) works with the Unit Coordinator to design, develop, and partially deliver some of the course content as a way of embedding information literacy within the unit.

The CO115 unit has historically been a challenging unit for instructors. Students are acclimatizing to university demands, and juggling different units and schedules for the first time. They are often unprepared for the rigors of scholarly research and writing at the university level. Over several years, the

CO115 unit has employed a standard lecture-tutorial structure, with the two major assignments comprising an annotated bibliography and an essay on a semi-structured topic. The annotated bibliography was intended to give students a start on the essay by providing early feedback on their choices of source material. Unfortunately, students tended to struggle with the annotated bibliography assignment, failing to understand its connection to the subsequent essay, and would produce poor quality annotated bibliographies that failed to serve the desired purpose.

The unit instructors agreed that students still needed an assignment that would help prepare them for the essay by introducing them to scholarly information sources, and giving them a chance to practise referencing and paraphrasing. A new assessment was designed around Wikipedia editing, with a focus on Australian health issues. In the new assessment, students would identify a gap in the Wikipedia literature, propose their topic, and write and publish an article. Students were assessed according to a rubric on content (depth and breadth of focus appropriate to the format), information sources (quality, timeliness and relevance) and article design (use of headings, tables and images). The subsequent essay assessment would be taken from the main topic of their Wikipedia article. The original plan with the evaluation project in question was to conduct focus groups to learn about the students' experiences of the new task, but these did not take place due to recruitment issues. Instead, the final articles were analysed to explore student engagement with the assessment in terms of writing and referencing. The ultimate project was undertaken to:

1. Investigate whether the Wikipedia assessment would help to improve students' sense of self-efficacy in terms of finding, evaluating and referencing information;
2. Investigate article and reference list length as a measure of student engagement; and
3. Investigate the types of references chosen by students as a measure of their ability to assess, search and evaluate information, as a precursor to a more "traditional" summative evaluation piece (the essay).

This project obtained ethics approval from the University's Human Research Ethics Committee. Students were able to opt-out of having their information used in this research project.

## **Literature review**

Wikipedia is already well-positioned as an essential information resource in the student world. A study from Monash University indicates that 87.5% of students use Wikipedia in their academic work (Selwyn and Gorard, 2016). Students use Wikipedia as a starting point in research because it is easy to access and prominent in web results (Todorinova, 2015, Colón-Aguirre and Fleming-May, 2012). New literature is revealing that many academics view Wikipedia positively as a background reference source, an attitude shift from previous years (Aibar et al., 2015, Soules, 2015). Wikipedia editing could also aid in boosting information literacy levels. In Roth, Davis and Carter's (2013) Wikipedia editing assessment, the majority of students reported that Wikipedia editing was superior to a research paper in helping to improve research and critical analysis skills. As a result, academic librarians are increasingly incorporating Wikipedia into their information literacy teaching (Calhoun, 2014, Oliver, 2015 & Van Hoeck, 2013).

The Wikipedia assessment discussed in this article is an example of an *authentic learning* task, in which the focus is on “real-world” problems that are complex, ill-defined and open to interpretation (Lombardi, 2007). The creation of a Wikipedia page mirrors the real-world research process: expressing interest in a topic, identifying a gap in the research, developing a proposal or outline, then researching, writing and publishing the work. By writing in Wikipedia, students experience peer-review and publishing in an essential resource (Eddy and Lawrence, 2013, Van Hoeck, 2013). This is in contrast to previous assessments in the CO115 unit where feedback was only given by the marker, with the finished product being an unpublished document retained by the student. The Wikipedia assessment was designed to engage the students by highlighting the importance of creating, rather than merely consuming, information and to alter the students’ consumer-based understanding of Wikipedia.

As Wikipedia’s core group of editors in the health topics is shrinking (Heilman and West, 2015) and has unequal gender representation (Hargittai and Shaw, 2014), students are helping to solve a real-world problem by contributing new articles. As most Wikipedia editors are based in the United States or Europe, Australian content is also less likely to be represented (Reynolds, 2015, Temperton, 2015). The Wikipedia assessment rubric encouraged students to explore the possibilities of Wikipedia by being creative in article choice, design, content and layout, incorporating aspects of *enquiry-based learning*. Enquiry-based learning encourages students to pursue a task with support from instructors, although the design and outcome of the project can be open-ended (Kahn and O’Rourke, 2005). Enquiry-based learning is closely linked to authentic learning as students must learn to be comfortable with ambiguity and complexity, which can pose a challenge for undergraduates (Lombardi, 2007).

Students were given a small self-assessment at the beginning and end of the semester to gauge their sense of capability in finding, evaluating, and referencing information. A self-assessment may not be the most realistic reflection of actual skill, as recent research suggests that even students with low levels of IL skill have an over-inflated view of their abilities (Gross and Latham, 2012). However, according to Bandura (1977), a strong sense of personal capability can correlate to levels of resilience, a much-needed trait for an undergraduate student. Research by Carroll et al. (2009) on Australian high school students shows that there is a strong relationship between self-efficacy and overall academic achievement. The IL self-assessment in CO115 was intended to give students a moment of reflection regarding their skills, and an insight into some of the main learning outcomes of the unit before embarking on the content.

### **Design/Methodology/Approach**

This project used an action research process commonly used in higher education as a systematic intervention to improve pedagogical practice (Somekh, 2006). Put simply, the action research process involves observing a problem, thinking of an intervention, carrying out that intervention, evaluating it, and incorporating knowledge gained into future practice (Norton, 2009). This method promotes an evidence-based way of approaching teaching practice, as well as providing a practical way for librarians to incorporate research into their everyday workload (Farrell, 2014). This cohort-based study looked at the following data: results from the information literacy questionnaire and an analysis of article length, reference list length, and reference list content, as well as a follow-up survey.

### *Self-assessment*

Students were asked to rate their capability in searching, evaluating and referencing information on a 10-point Likert scale. The 3-item questionnaire was delivered online via the Learning Management System (LMS) in Week 2 and repeated in Week 12 of semester. The questions were as follows:

On a scale of one to ten, how would you rate your capabilities in finding relevant scholarly information online?

On a scale of one to ten, how would you rate your capabilities in evaluating scholarly material (e.g. journal articles) for use in an assignment?

On a scale of one to ten, how would you rate your level of familiarity with the APA Referencing Style?

### *Article Analysis*

The articles the students ultimately produced were analysed in terms of word count, length of reference list, and types of references used (book, journal, web and news/media). The assignment set the minimum word count as 500 words, and the minimum number of references was three. The word and reference list item count served as an indicator of student interest in the assignment, to determine whether they would surpass or adhere to minimum requirements in terms of word count and references. The reference list analysis also investigated the types of references used as an indicator of students' information evaluation skills.

### *Assessment Design*

The assessment design was adapted from the Wikimedia Education Foundation's (2012) lesson plans on teaching Wikipedia to undergraduates. The Wikipedia assessment was set on the first day of semester, with a due date in Week 6. The assessment was used as a vehicle for teaching the information literacy principles of *assessing the information need, finding, evaluating, and referencing* as stated in the Australia and New Zealand Information Literacy Framework (Bundy, 2004). Each week, students would learn a new principle in a lecture, and get the opportunity for authentic practice in Wikipedia during tutorials. Students added their topic to a communal Google Drive spreadsheet so they could avoid duplication. Students "submitted" their assignment through the LMS by providing their username and the Wikipedia permanent link to their most recent edit. Tutors marked the work by reviewing the edit history on the respective page.

## **Findings and Results**

### *Self-assessment*

The students' self-rating improved moderately by the end of semester, particularly in relation to capability in referencing (see Table 1). Overall, students reported being more capable in finding, evaluating, and referencing information. The students scored well overall on the Wikipedia assessment considering it was

the first university-level assessment the cohort would have undertaken, with most students receiving grades of 65% and above.

### *Article Analysis*

Some students had initial difficulty choosing their Wikipedia topic and needed help from tutors to develop a topic appropriate in scope and content. However, most of the topics chosen were relevant in filling the gap in Australian health content within Wikipedia. Table 2 illustrates a selection of student topic choices gleaned from the signup sheet.

Based on past performance in the unit, the instructors expected students to adhere to the “bare minimum” in terms of word count and references. However, the average article produced was 1194 words (Table 3), with an average of twelve references per article (Table 4). This was an interesting outcome, as in past assessments, students struggled to provide the minimum number of references stipulated. The minimum listed for the Wikipedia assignment was three references, however this information was not overly emphasised in the unit. The composition of the reference lists was also interesting, given that there have been issues with students using poor-quality references in past assignments. The marking rubric was not overly prescriptive about the content of the reference lists beyond emphasising relevance, timeliness and variety. Students tended to favour websites (50%), followed by journal articles (36%), books (9%), and newspaper articles (5%) (Table 5). Considering the prevailing subject matter (public health topics), this mix shows a well-considered use of information appropriate to the task. Reference list analysis revealed that a significant portion of content came from government, nonprofit organisation or trade association websites, with very few using commercial sites. Newspaper articles were used appropriately, usually for topics such as sport doping scandals, or profiles of notable people.

### *Follow-up survey*

Six months after the completion of the articles, a group of randomly selected students were sent an email with a link to a short survey inviting them to describe their feelings about the Wikipedia assignment. In the email, the individual students were given pageview statistics on their specific pages since their creation (due to the time-consuming nature of gathering pageview statistics, as well as drop-offs in enrollment since the completion of the unit, only 18 students were chosen to receive the email with the survey). Of this group, 7 responded to the survey with comments.

The first question, “What did you think of the Wikipedia assignment (positive or negative)?” received mostly positive responses, including:

I thought it was an interesting experience and had a bit of fun creating it.

I thought the Wikipedia assignment was really good. It’s a good way to get Australian health subjects on Wikipedia as [the] majority of the subjects on there are not exclusively about Australia.

Firstly, I thought of it as a weird assessment to do for a university assignment, quite odd was my initial thought. However in the end I saw why we did the Wikipedia assignment. Overall it taught us as students different ways to write and research topics.

It took quite a bit of time, but I enjoyed it.

I really enjoyed the Wikipedia assignment. Because I had a netball injury myself I found the assignment very rewarding and interesting and it was beneficial to study something I have a strong passion about.

I thought it was a great way to see how Wikipedia works, but also showed how easy it is to edit Wikipedia, so would not use it for a reliable source for finding information.

The second question, "What did you find challenging about it (positive or negative?)" revealed a range of challenges, including:

Gathering resources to use. Finding images to display.

I am not very computer savvy. This made it very difficult especially when we were told we could write our draft in Word then transfer it to the sandbox on Wikipedia however different formats between Word and the Sandbox were not compatible and you couldn't copy and paste, especially with the tables. My page had a lot of tables so I pretty well had to rewrite the entire thing into the sandbox, it was especially annoying when the guy from Wikipedia couldn't even help me.

Writing in a formal but non-academic style was a challenging concept for me to grasp. I think finding different sources of information and putting it into your own words [was challenging]. I found this to be challenging, but a challenge is good.

I didn't find anything overly challenging. Probably just trying to figure out the layout of Wikipedia and I would have liked to have used my own photos but couldn't.

It was challenging to create the hyperlinks and to upload the assignment -I had a few issues in submitting - there wasn't much prior literature on the topic.

To the third question, "Do you feel you can use any of what you've learned outside of the unit?" responses were mostly positive, including:

Yes, I play Football so I think it's interesting to learn the statistics of concussions that occur while playing.

Definitely can and still do use the information I learned outside of CO115.

Absolutely! During this assessment we learnt many skills in writing and also researching a diverse range of articles to find the ones which suited our needs best of all.

Probably one day, I haven't had to yet though. Apart from referencing.

Yes definitely. All of the psychological issues. I faced a lot of issues myself with going back to netball after my knee reconstruction and this helped me to understand why I was having these feelings of distress.

Yes if ever I wanted to add information to Wiki I would know how.

Not really other than researching. The referencing was different and so that didn't give us any practise with the APA style.



The fourth question, “Do you feel the Wikipedia assignment supported your writing skills? If so, how? If not, why not?” received a mixed response:

Yes. Because I find it quite easy to write in a report format.

As I was in my first semester at Uni and I did not complete high school my writing skills are not that flash. I found it helpful to compare layouts and structure to other pages.

Personally no, I feel like my writing style is very formal and academic which is also why I felt challenged with this article.

Yes, not a lot but definitely improved a bit. I think it is a different style of writing and helped you categorize different information. I also think it helped with paraphrasing skills and being able to pick out the important parts of a source.

Yes because we needed to ensure it was professional and accurate to be posted online.

It broadened my writing skills as it wasn't a standard essay style of writing.

I feel like because it was done on Wikipedia, it didn't feel like it was as formal as it could if done on another website.

The fifth question, “Did anything surprise you about the editing process?” showed that students were mostly unfazed by the editing process:

Not really.

It surprised me that the sandbox was not as straight forward to use as I had expected. Maybe having an FAQ or guideline would be helpful.

Nothing really surprised me as such, however as soon as I published my article an hour later we had edits to change grammatical structure which surprised me somewhat.

I think we were guided through the whole process really well, so the editing was made easy. If we did not have help along the way I would have found editing way harder.

Nothing was too surprising. I never actually realised how simple it was to make a Wikipedia page though. Yes how easy it is to edit wiki.

The referencing style and ease.

## **Discussion and Recommendations**

One of the more interesting findings of this case study was the students' approach to article design and referencing in Wikipedia. Considering the motivation issues that this student population has traditionally faced, it was surprising to see the volume of work produced, with some students producing work with upwards of 3000 words. This could be due to student familiarity with Wikipedia - having a sense of what a “good” Wikipedia article looks like in terms of length, style and layout. Another reason could be connected to the fact that students were allowed to choose their topic, and some seemed quite passionate about what they produced. Roth et al. (2013) found that students were motivated to edit Wikipedia for a variety

of reasons, including awareness of their work's visibility to the public, and knowing that their work "had a purpose".

Students seemed to have no issues with the mechanics of referencing in Wikipedia as they easily produced reference lists upwards of twelve sources, with several upwards of twenty. One explanation for this could be that the referencing style was not emphasised as much as the act of referencing itself. In this assessment, students did not have to take time formatting reference lists; referencing was as simple as selecting "cite" in the Wikipedia editing menu and filling in the fields. Perhaps this simplicity of use helped to account for the improved numbers of references in each article. Van Hoeck (2013) discovered a similar enthusiasm in engineering students, who borrowed nearly double the usual amount of books while completing their Wikipedia articles. However, one of the students did comment in the follow-up survey that the assessment didn't give them a chance to reference using the APA referencing style specifically. While this is a valid point, it is the belief of the Health Sciences Librarian (HSL) that it is more important for students to understand the "why" of referencing (principles of citation) before learning the "how" (mechanics of style). In the HSL's observations, instructors may become myopic when marking based on style while forgetting the broader messages about academic integrity. As digital information becomes easier to access and plagiarise (and more complicated to reference), rubrics should focus on a student's general understanding of academic integrity as well as of the rules of formatting, the latter being evidence that the former has been understood and applied. Another factor in the high reference count was the inclusion of Web sources, whereas in previous assignments this was restricted. This is in line with Sormunen and Lehtio's (2011) findings, although in this case the Web resources accounted for a lower percentage of information sources used. The web sources students did select were relevant, appropriate, and of reasonable quality, coming mainly from government websites.

The Australian Wikipedia community (groups of frequent editors and local volunteer administrators) were invited to track the students' progress, which was the topic of a few discussions on various "talk pages" (pages used by editors to discuss edits) in Wikipedia. The following comment was written on an administrator discussion board (now since deleted from Wikipedia):

I think it's really good to see this kind of project coming out of universities: Wikipedia often gets a bit weak on these kinds of broad-brush topics, especially on health/science topics and at a national level, and I think these efforts are well-suited to making sure those areas get covered. Some of them need a bit more work to push them into an encyclopaedic style but most of these are the kinds of area[s] that are really complementary but gaps that we would really struggle to fill otherwise.

Another comment read: "Most of the articles are significantly better than the average newcomer articles". However, some had suggestions for improvement in expression, such as the inclusion of greater detail in referencing and the use of less persuasive language. A few Wikipedia contributors felt that students could contribute more by improving existing Wikipedia articles rather than creating new ones.

There were a few difficulties with administering this assessment. The main technical issues arose when students needed to move their draft articles into the publishing space; Wikipedia restricts this move to those who have done a minimum of five edits. However, the instructors were able to override this on behalf of the students with little difficulty. The biggest challenge for most students was choosing a topic, identifying a "gap" in the literature, and researching the relevance of the topic for Wikipedia in terms of

scope and content. Lombardi (2007) notes that authentic learning activities can be a tough adjustment for first-year students, who can be uncomfortable with ambiguity. However, once the topic was decided, students seemed to adjust quite easily to Wikipedia's editing environment.

## Limitations

There are several limitations in this project. A limited amount of qualitative data was gathered from students regarding their attitudes and motivations for completing the assessment. Focus groups were planned but were not able to be realised, and only a few completed the follow-up survey. The quality of the subsequent essays derived from the Wikipedia assessment was not part of the current investigation, although the instructors marking the later work mentioned that students had less opportunity for plagiarism as each topic was unique, indicating positive outcomes for academic integrity overall. Future research could investigate any direct correlation between the Wikipedia assessment and the subsequent essays in terms of the quality of the research and topic exploration. The self-assessment on student self-efficacy was not a comprehensive assessment, as it was only three questions long and scored on a Likert scale. Student work was also not checked for plagiarism via plagiarism-detection software, nor was plagiarism a focus of this study.

## Conclusion

Wikipedia's reputation is improving on university campuses and its ubiquity as an information source provides an opportunity to improve student information literacy skills in a familiar environment. This article describes a project in which Wikipedia editing was used as a vehicle for teaching information literacy principles in an undergraduate communications unit. While the student motivations and experiences of Wikipedia editing were not thoroughly investigated, the artefacts produced and students' results show how well students respond to an authentic learning task with "real-world" implications. Students approached the assignment with little difficulty, producing full-length articles on unique topics along with appropriate reference lists and information sources. Wikipedia editing is a useful authentic learning task for teaching students how to plan, research, write and publish an article on a small scale, and become critical producers, rather than mere consumers, of information.

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