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Karen Patten

*Integrated Information Technology, University of South Carolina, Columbia, SC, United States., pattenk@sc.edu*

Lynn Keane

*Integrated Information Technology, University of South Carolina, Columbia, SC, United States., lynn.keane@mailbox.sc.edu*

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# Integrating Wikipedia Projects into IT Courses: Does Wikipedia Improve Learning Outcomes?

**Karen Patten, Ph.D.**  
Integrated Information Technology  
University of South Carolina  
pattenk@hrsm.sc.edu

**Lynn Keane, Ph.D.**  
Integrated Information Technology  
University of South Carolina  
lkeane@hrsm.sc.edu

## ABSTRACT

Many college students are advised to not use Wikipedia in any class research projects. However, studies into the pedagogical value of using Wikipedia to achieve course learning outcomes have shown promising results. The Wikipedia Foundation established the Wikipedia Public Policy Initiative (WPPI) in Spring 2010 to explore its potential value to improve information literacy, collaborative learning, and student engagement. By May 2011, more than 800 students at 24 U.S. universities participated in the pilot project. The WPPI was renamed the Global Education Program (GEP) and expanded in August 2011 to include 60 American courses in many academic disciplines. This exploratory paper describes the experiences of students and professors in two GEP information Technology courses at the University of South Carolina. Using student and faculty reflections, this paper addresses the potential learning outcome benefits and the potential issues using Wikipedia projects in the classroom. As the first step of a larger longitudinal study, the paper also recommends improvements for continuing the integration of Wikipedia projects in future courses.

## Keywords

Wikipedia's Global Education Program, information literacy, learning outcomes, IT student soft skills, critical thinking

## INTRODUCTION

During the Spring 2011 Scholarship of Teaching and Learning (SoTL) Commons Conference at Georgia Southern University, representatives from Wikipedia presented preliminary findings from the first semester [Fall 2010] of the Wikipedia Public Policy Initiative (WPPI). The representatives showed videos of participating students discussing their Wikipedia policy writing projects, what they learned, how they felt, what was good, and what was bad. The representatives came to the SoTL conference to recruit professors for their fall 2011 courses for the Wikipedia Foundation's expansion of WPPI to become the Global and United States Education Program. The authors of this paper attended that presentation, became excited about the potential application of a systematic, targeted, and semester-long writing project and its potential to improve student information literacy and writing skills. The authors each volunteered one of their Fall 2011 IT courses for the program. These two IT courses became part of the United States Education Program's sixty American courses (Obar & Roth, 2011). This paper describes the experiences of students and professors in two GEP information Technology courses taught at the University of South Carolina. Using student and faculty reflections, this paper addresses the potential learning outcome benefits and the potential issues using Wikipedia projects in the classroom.

The next part of the paper provides background including the pedagogical concerns and benefits of using Wikipedia as a teaching and learning tool at the university level. The next section discusses related research and literature about Wikipedia. Then we describe the goals and objectives of the Wikipedia United States Education Program and the commitment to the universities and students participating in the program. We then describe the two IT courses, the student Wikipedia assignments, the expected learning outcomes, and the experiences of the students and the instructors during the semester. Finally, as the first step of a larger longitudinal study, the paper also recommends improvements for continuing the integration of Wikipedia projects in future courses.

## BACKGROUND

Mass collaboration is one of the newest trends in the creation and dissemination of knowledge and information (Fallis, 2008). Mass collaboration involves the possibility of millions of contributors separated by thousands of miles to collaborate on a single project. Another definition is a system created through mass collaborative contributions to build "a long-lasting artifact that is beneficial to the whole community" (Doan, Ramakrishnan, & Halevy, 2011). One example of a popular mass collaboration is the development of the Linux open source operating system (Duguid, 2006). Other mass collaboration or

crowdsourcing (CS) systems, specifically Web-based, include YouTube, Flickr, ehow.com, Yahoo! Answers, openmind, and Wikipedia (Doan, et al., 2011).

However, mass collaboration efforts are not always successful. When contemplating the use of Wikipedia within our courses, several aspects of a mass collaborative project were attractive to us. One author appreciated the value of using Wikipedia projects to address information literacy learning objectives, especially since these learning objectives are newly required as part of the General Education core curriculum (General Education at the University of South Carolina, 2012). Wikipedia has been found to be a useful tool for teaching students about the reliability and credibility of content (Davidson, 2007). In addition to the potential Wikipedia projects addressing information literacy learning objectives, the second author saw the value of negotiating meaning and becoming a contributing member of an online community as enticing learning objectives, as well.

One potential benefit of Wikipedia is its epistemic benefit through 'crowdsourcing' (Fallis, 2008). Anyone with Internet access can create and edit Wikipedia content. Wikipedia is one of the top ten Internet domains. It consistently appears in the first ten results of any Google search. Finally, Wikipedia serves as an aggregation point for online encyclopedia information, similar to the way eBay serves as an aggregation point for online auctions.

The following quotes describe the pros and cons of using Wikipedia as a research tool (Wikipedia, 2011).

*"One should assess one's sources and what is desired from them, and that 'Wikipedia may be an appropriate resource for some assignments, but not for others.' the article cited Jimmy Wales' view that Wikipedia may not be ideal as a source for all academic uses, and (as with other sources) suggests that at the least, one strength of Wikipedia is that it provides a good starting point for current information on a very wide range of topics."*

*"In 2007, the Chronicle of Higher Education published an article written by Cathy Davidson, Professor of Interdisciplinary Studies and English at Duke University, in which she asserts that Wikipedia should be used to teach students about the concepts of reliability and credibility... She also states 'Instead of resorting to the "Delete" button for new forms of collaborative knowledge made possible by the Internet, why not make the practice of research in the digital age the object of study?"*

Wikipedia provided guidelines for the GEP that described four ways that students can use Wikipedia articles to improve information literacy. The first is to learn how to 'study and critique any article.' Students are given tools to critique an article. They also learn how to post their critique and suggestions for content contributions for community discussion on the 'article talk pages.' Secondly, students learn how to compare Wikipedia articles to other reference sources. Part of learning to critique and article is to learn how to evaluate the reference sources. When comparing articles about the same topic from different sources, students determine if this is an encyclopedia-type entry, descriptive in nature, or a more scholarly theoretical or review article. The third way students learn is by comparing Wikipedia articles to other journalistic articles by determining what is newsworthy as well as the quality of the facts, lack of bias, etc., in the article. How exactly do Wikipedia articles compare to mainstream news media reports and stories? Finally, through Wikipedia tools, a student can actually chart the evolution of an article to see how the content can drastically change over a news cycle and who contributes to the article. This last benefit demonstrates how information changes and is transformed in the Internet age.

One of the strengths of using Wikipedia as a research tool is that the reliability and the quality of every article can and should be evaluated. For example, measuring the following criteria establishes reliability of a Wikipedia article:

- Accuracy of information provided within article;
- Appropriateness of the images provided with the article;
- Appropriateness of the style and focus of the article;
- Susceptibility to, and exclusion and removal of, false information;
- Comprehensiveness, scope, and coverage within article and in the range of articles;
- Identification of reputable third-party sources as citations; and
- Susceptibility to editorial and systemic bias.

The quality of information within a Wikipedia article (or, for that matter, any article) can also be determined by its:

- Accuracy - Accuracy is the degree of veracity while precision is the degree of reproducibility.
- Currency - Social currency is a common term that can be understood as the entirety of actual and potential resources which arise from the presence in social networks and communities, both digital or offline.
- Completeness – Completeness is having all necessary parts, components, or steps.
- Comprehensibility – Comprehensible is being understood or being intelligible.

## RELATED LITERATURE

Several researchers have reported both benefits and issues within the education literature concerning the use of Wikipedia within the classroom.

### Why Wikipedia?

Kolowich identified several ways that students can benefit educationally from using Wikipedia (Kolowich, 2011):

- Data from a Public Policy initiative suggested that students writing within Wikipedia tended to produce relatively high-quality work. Public policy entries improved markedly after students worked on them, according to preliminary analysis by the Wikimedia Foundation.
- Beyond grades, the fact that students are producing work that will be scrutinized by the public, not just a professor, heightens the incentive to do good work, several professors noted.
- Developing thick skin and sharp elbows is something students ought to learn – and something professors often neglect to teach.
- Steven Loordens, a psychology professor at the University of Toronto, reported these benefits of Wikipedia: *“A big part of the formative part of the assignment is to think about these things, self-reflect, look at your own work - all these metacognitive processes that we have such a hard time teaching - and in this case actually defend yourself, I think that is fantastic.”*
- When students publish to an authentic audience, not just their teacher and peers, they work harder at the quality of their writing (November, 2012).

### Issues with Wikipedia Projects

On the other hand, Kolowich (2011) and several others also identified issues when using Wikipedia. For example, public scrutiny can be a double-edged sword. Scrutiny can lead to higher quality work, but also expose poor quality. Also, it takes a considerable amount of time to acclimatize students to the social and technical aspects of working in Wikipedia. Students will become discouraged when their contributions are swiftly deleted by faceless critics, sometimes without explanation, although there is usually a very good explanation for the deletion. Another drawback identified by professors was the time it takes to prepare students to research, write, and complete a Wikipedia assignment. This is time that might otherwise have been spent on learning additional content. Another difficult concept for students to grasp is that it is okay to edit other students' work, and that, by doing so, *“It is not a breach of trust, but an act of responsibility and mutuality”* (Hemmi, Bayne, & Land, 2009, p. 28). Bravo and Young (2011) reported that initial fears by graduate students in a teacher education program dissipated after the first wiki writing assignment.

## WIKIPEDIA UNITED STATES EDUCATION PROGRAM (USEP)

The Wikipedia U.S. Education Program (USEP), now in its fourth semester, provides resources, articles, suggested syllabi, and activities to encourage and assist faculty in integrating the use of Wikipedia into their university classrooms to support course learning objectives. Generally, students in university courses strive to improve Wikipedia articles related to course content (Wikipedia, 2012; Obar & Roth, 2011). As part of Wikipedia Foundation's Global Education Program, the goal of the United States Education Program is to “engage students and professors across disciplines, universities, and countries in using Wikipedia as a teaching tool” (Wikipedia 2012, paragraph 2). A unique component of the USEP is the use of campus and online ambassadors. Campus ambassadors are trained by Wikimedia to work at the university to assist faculty, while online ambassadors are wikipedians who have volunteered to provide expert asynchronous support to students and faculty.

## IT COURSES AND WIKIPEDIA PROJECT DESCRIPTIONS

After seeing a presentation about the Wikipedia Public Policy Initiative in Spring 2011, the authors decided to implement Wikipedia projects into their IT courses during the Fall 2011 semester. One author integrated a Wikipedia project into an upper-level Training Systems course. The other author integrated a Wikipedia project into an upper-level Telecommunications Management.

The Training Systems instructor attended regional campus ambassador training at Georgia Southern University from September 19, 2011, through September 20, 2011, with the objective of learning how Wikipedia can be incorporated into courses, how to support students and faculty, and what are the resources available for project development. The two faculty members integrated Wikipedia projects differently into their courses, but included similar formative and summative

reflection assignments throughout the projects. In addition, the two faculty members met regularly and discussed how the projects were progressing and to determine if changes were needed to be implemented before the next step or task.

After the Campus Ambassador training in September 2011, The Training Systems instructor started the project. The training provided the necessary guidance needed to organize the project and create the course page on Wikipedia. Therefore, in the Training class, the Wikipedia project was launched towards the middle of the semester on October 10, 2011 and lasted through the end of the semester with submission of final project reflections. The Wikipedia project replaced the traditional research project on E-learning trends and technologies and addressed the following learning objectives:

- Research and articulate current issues and trends related to developing technology-based training, learning, and performance systems and e-learning;
- Identify resources for staying current in training systems development and e-learning;
- Demonstrate appropriate and ethical behavior and effective work habits; and
- Develop writing and research skills.

The focus was different for the advanced Telecommunications Management course Wikipedia project. The purpose of the assignment was for each student to develop a better appreciation and knowledge of at least one telecommunications technology topic by actually researching and becoming more expert on the topic. The specific learning outcomes for the assignments was that students will be able to:

- Use, manage, and communication information using appropriate technologies;
- Demonstrate the use of available online and print resources to gather information on a telecommunications technology topic; and
- Prepare a written research paper, prepare and present an oral presentation, and facilitate a virtual discussion on the topic.

The Telecommunications Wikipedia project also replaced the traditional research project on telecommunications technology topics. It was the specific expectation of the professor that students would produce a better written report for the public and the world to see, than they would for only their professor to read.

Both projects included five distinct tasks:

1. Task One: Select Your Topic (20 points)
2. Task Two: Learn About Editing and Writing in Wikipedia (40 points)
3. Task Three: Propose Your Project (10 points)
4. Task Four: Edit Your Article (50 points)
5. Task Five: Discussion and Reflection (30 points)

The Wikimedia education project developed a 'course page' template that included editable steps and resources ([http://en.wikipedia.org/wiki/Wikipedia:United\\_States\\_Education\\_Program/Courses/Training\\_Systems](http://en.wikipedia.org/wiki/Wikipedia:United_States_Education_Program/Courses/Training_Systems)). The five project tasks were broken down into further steps and added to the course page in Wikipedia. Since both instructors were beginners at using Wikipedia within the classroom, they each selected the following Wikipedia 'Learning Tools' to use within both courses:

- Steps 1 and 2: Orientation to Wikipedia
- Step 3: Orientation to the topic
- Step 4: Using sources
- Step 5: Choosing articles
- Step 6: Drafting starter articles
- Step 7: Continue editing
- Step 8: Building articles
- Step 9: Getting and giving feedback
- Step 10: Responding to feedback
- Step 11: Reflective essay.

One of the resources for supporting faculty in creating a course page on Wikipedia is the 'course page wizard.' The wizard assists a faculty member to 1) start your course page; 2) add the course description; 3) list instructor and ambassadors; 4) create assignment timeline; 5) add list of articles; 6) develop grading rubric; 7) list students; 8) start 'Discussion,'

'Resources,' and 'Getting Help' tabs; and 9) add your course to course list (Wikipedia, 2012). Once the wizard was completed, each course was then listed on the U. S. list of participating university courses for the Fall 2011 semester.

## FINDINGS

As part of the exploratory project, the instructors recorded notes during the semester on their experiences and their student experiences.

### Student Feedback and Reflections

Both instructors gave 'student reflection' assignments during the semester. At the end of the semester as a final task for the Wikipedia project, students in the Training Systems course were asked to reflect on their ability to research and write Wikipedia articles. They were asked what they learned about the culture of Wikipedia and the collaborative nature of contributing to Wikipedia. They were asked to look over their submitted work and discuss their progress from assignment to assignment, including where they experienced confusion and where they experienced understanding. They were asked what might help them understand or complete the assignment better and which assignments needed more focus or practice.

For example, in the Training Systems course, the instructor asked the students the following questions:

*Wikipedia Critical Thinking and Writing Assignment (with your specific telecom topic) - This was a "pilot" project since neither you nor I had ever worked with Wikipedia. The purpose of these questions is for me to gain from your experience to design a better Wikipedia project for my future classes.*

1. *What did you like and dislike about the project? Do you think you might stay involved with Wikipedia by using it as a source for future work, by actually editing other articles in the future? Why or why not?*
2. *What recommendations can you make about improving the assignment for future classes?*

The following student reflections support the Wikipedia course projects:

- *Informative*
- *Useful in teaching credibility of online resources*
- *Did meet selected course objectives*
- *Learned a lot*
- *Had to provide support for my content*
- *Liked being introduced to the other side of Wikipedia—"where the magic happens"*
- *Improved my writing and research skills.*

Student reflections on becoming a member of the Wikipedia community include:

- *Interested in becoming an official user of Wikipedia, which allows me the same rights as any other "Wikipedian" in editing and creating articles*
- *As the semester progresses, I started to understand more and more of the Wiki culture*
- *I was happy to see that the initial edit that I made survived as long as it did.*

Students also reflected on some of the earlier identified issues with Wikipedia projects:

- *Had trouble with first selecting an article*
- *It can be a little daunting to create an article when you are just starting out in Wikipedia and are not sure what to do or how to do it.*
- *At first, I was apprehensive on how the whole process worked because this information could be read and used by others around the world.*
- *Did not like that my edits could be deleted or changed before my instructor had a chance to look at them*
- *Also did not like having to edit Wikipedia articles when most professors will not allow citing of Wikipedia as a source for a paper*
- *Maneuvering through the edits was a harder task than I initially expected*
- *Using Wikipedia is a great idea, but, in application, using a non-respected resource as a means of promoting research is a bit backwards.*

## Instructor Reflections

Since the Training Systems course project was not started until the middle of the course, there wasn't enough time for students to fully and comfortably complete each task. In addition, several students voiced opposition to posting content publically on the Internet. After initial concerns were voiced, one of the Campus Ambassador training facilitators was consulted for advice. He provided the following advice, which helped:

*I think it is normal for some students to resist the idea of contributing to Wikipedia. Rather than phrasing it as "publishing their writing to the world," I might instead phrase it as "contributing to an ongoing knowledge project." That is to say, it's not really "their writing" as in asking them to publish an essay about themselves - their first car, their first kiss, the time grandmother died, etc. It's not a statement about them. Rather, they are knowledge-makers in training, and they are going to try to find a place to practice contributing to the knowledge base. I would also reinforce that the project is part of the legitimate goals of the class. They have come to the class to learn its content, and the highest level of content mastery is becoming a practitioner. So contributing to Wikipedia (a process which involves reading, researching, revising, as much as composing and inventing text) is a great place to start becoming a practitioner.*

*You might also consider asking the students who have serious reservations to meet with you one on one so that they can talk more about what is bothering them. I would also reinforce a practice which does not require their content to "stick" in order to receive a grade (B. Cummings, personal communication, September 27, 2011)*

The concerned student was enrolled in both courses implementing the Wikipedia project during the Fall 2011 semester. He initially agreed to proceed with the assignment, but then balked when another student's submitted article in the Telecommunications course was immediately removed after posting. To accommodate the student's concerns, the Telecommunications instructor allowed the student to complete the more traditional telecommunications technology topic assignment used in earlier classes.

The previously identified issues about time occurred during both courses. The writing project as developed by Wikipedia did require students to work on individual smaller tasks every week. In the Telecommunications course, students started on the project the second week of the semester. They were able to complete all the steps. However, it does take considerable time to acclimate students to the social and technical aspects of working on Wikipedia. As a result of the extra time spent on information literacy topics rather than telecommunications technology topics, the instructor had to remove some of the telecom assignments from the course.

Overall, students recognized the value of working with Wikipedia, however, they voiced concern during and after the project about how their contributions are viewed and valued. They didn't want to see their work being immediately removed. More time and smaller deliverables may be necessary for students to become acculturated to Wikipedia.

## IMPLICATIONS FOR FUTURE PRACTICE

As the first step of a larger longitudinal study, the use of Wikipedia in the Fall 2011 semester led to suggestions for improvements from both the students and the instructors for continuing the integration of Wikipedia projects in future courses. The following are suggestions for project improvement:

- Working in groups to create a page would be more meaningful
- Spend time on finding content from other sources; more focus and practice on researching better content
- Having more relevant research would help me to complete the assignment better
- The actual task of editing a Wikipedia article needed more focus and practice
- More time should be devoted to the project after the initial edits are made
- Maybe the instructor can pick their own article to edit, and then show the class the edits made, the syntax for making edits, any discussion on the discussion page about the edit, etc.
- Assign this project closer to the beginning of the year, so more opportunities for editing are possible
- Edit articles as a class first so process is clearer
- The assignment should either be more involved or worth less points

This paper was intended to report on one semester's experience. As a result of that experience, both instructors are lessons learned in their Spring 2012 courses. The instructors plan to more carefully study the implications of using Wikipedia within their IT courses on a going-forward basis and report on this longitudinal study in future papers.

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