

Using a Collaborative Wiki in a Low Stakes Environmental Health Classroom Exercise to Promote Environmental Stewardship

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ABSTRACT

Student learning in environmental health sciences involves, in part, investigating life choices that are "eco-friendly" and less damaging to the environment and public health/wellness than traditional choices. Presented here is a wiki assignment that can be used in small (20 students) to large (80+ students) classrooms to 1) have students investigate eco-friendly alternatives relevant to undergraduates and those about to be independent and enter the work force 2) evaluate the environmental impact of eco-friendly alternatives and 3) clarify the availability of these options. Surveys found that 48% of students identified a post on the site that will direct their behavior.

KEYWORDS

wiki, environmental stewardship, environmental impact, undergraduate assignment, low stakes

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Introduction

In environmental health sciences, practical applications of lessons aimed at understanding human environmental impact are included in courses. For a 3000-level introductory course in Environmental health sciences, a class wiki assignment was implemented so that students could determine sound eco-friendly alternatives to practices and products that could be used in their daily lives, or those that could potentially be used when they graduate, live independently, and are in the workforce. This assignment takes the first two steps of the classic educational approach to students imparting a change in behavior based on learning: informational knowledge and ownership (Hungerford & Volk, 1993). Students may contribute to a wiki on eco-friendly alternatives with any type of information that will enhance stewardship. The wiki that was created for class was based on a Google Sites platform and

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configured such that only the instructor and the students in the current sections of the class had access to view and edit the site.

Pedagogical methods used in science course design can be catered to incorporate the scientific method and data analysis into assignments and classroom activities. Useful in this endeavor are wikis that can serve as a secure place for students to post their work and get feedback in comments from other students (Woo, Chu, & Li, 2013). Student contributors to wikis create knowledge with content rather than just take in information, thus empowering them in the learning process (Farabaugh, 2007; Hungerford & Volk, 1993). And, learning to contribute to wikis is important in many disciplines, especially the sciences, as more and more databases and information is posted on wiki platforms (Giles, 2007; Hoffmann, 2008). These platforms are abundant and can be used in simple, secure manners to ensure compliance with FERPA and allow for student contributions (Raitman, Ngo, Augar, & Zhou, 2005). For example, common wikis used in undergraduate classrooms are Google Sites, Google docs, Peanutbutter Wiki, Blackboard, Wiki Splits and Wiki threads (Zhou, Simpson, & Domizi, 2012). These wikis can be used for traditional posts with comments or collaborative writing projects, both of which foster collaboration through a classroom social media approach to learning (Gibbons, 2010; Stoddart, Chan, & Liu, 2016). In addition, wikis have been thought to function as authentic learning tools, such that the student is the “doer” and has an applied connection to the real world (Eddy & Lawrence, 2013).

In addition, wikis are an excellent tool for instructors to assess student performance. Wikis in this case assessed the students understanding of the environmental impacts of college life, ability to calculate those impacts, and writing/communication skills. This work aligns with previous studies that assess literacy in lower level learners and improving pedagogical techniques (Wake & Modla, 2012). Not only do instructors prefer using wikis for certain assignments, students at the undergraduate and graduate level tend to prefer the use of media and wikis within the class setting as a break from traditional lectures (Zhang & Olfman, 2010). These wiki platforms are of use to confer content to students and wikis also afford a setting in which students can develop social ties and connect with each other (Donne, 2012; Lin & Yang, 2011; Wheeler, Yeomans, & Wheeler, 2008).

Because students understand that they must post to a site that will be viewed by other students and comment on another student’s post (and perhaps have someone comment on their post), this assignment is essentially peer reviewed. Students must review wiki posts in order to add a productive comment to another student’s post for 1/3 of the assignment grade. When students are directly peer-assessed they are generally more satisfied with assignments overall (Xiao & Lucking, 2008).

In addition to the wiki post and the comment required by the assignment, a flipped classroom activity using a scavenger hunt model was developed to determine whether the number of posts viewed by students could be significantly increased artificially. This flipped classroom activity was administered in one of two sections of the course. Flipped classroom activities are being used quite often successfully with millennials to promote active learning (Phillips & Trainor, 2014; Roehl, Reddy, & Shannon, 2013). These

classroom activities also promote a connectedness to the real world (Balzotti & McCool, 2016), which is one of the learning objectives of the assignment described.

Here, combined is a low stakes wiki assignment for individual students paired with a flipped classroom activity designed to impart environmental stewardship for students taking an upper level introduction to environmental health science course. The wiki assignment was given to a class without the flipped classroom exercise as a control to see whether the activity would boost wiki views significantly.

Methods

Participants: Participants were 93 students enrolled in two sections of Introduction to Environmental Health Sciences (EHSC3060) at the University of Georgia. All students were given the opportunity to participate in the post-assignment survey. Seventy-three responses were collected. Two weeks post-assignment due date, students were informed of the purpose of the study and were given an IRB approved consent form, followed by the survey.

Surveys were distributed at the end of the class by a teaching assistant while the professor left the room. It was distributed in the two sections of an Introduction to Environmental Health Science Course in which the assignment was given. Of the 48 students in the Monday, Wednesday, Friday (MWF) section, 35 participated and filled out the surveys. Of the 45 students in the Tuesday, Thursday (TTh) section, 41 participated and filled out the surveys. There was no statistical difference between some of the questions between sections and in those cases, the data were combined.

Students in both sections were given the assignment posted below. However, the students in the MWF section were given a scavenger hunt in addition to the base assignment. The scavenger hunt was a packet of 100 questions about posts from the wiki to be answered in groups of 5. Scavenger hunt questions were a combination of multiple choice, short answer, and true/false. In order to answer the questions, students had to go to the post and read through its content. Students were able to divide the questions among the group, or work together as a group or in subgroups to find the answers.

Platform: Google Sties was used as the platform for the class wiki. It was set so that the site was not open to the public. Only the instructor, the teaching assistant and students in the current semester had access to view or edit the site.

Assignment: The assignment was worth 15 points out of a possible 450 points for the semester. Posted to the Wiki's home page was the following assignment rubric:

- Assignment: Make 1 post to the Alternatives page
- Comment on at least 1 post from other students

** There is no length requirement; simply follow the guidelines below.

- Graphic/Picture Relating to the Topic (1 pts)

-> Be sure to follow the image size guidelines found at Inserting Pictures



- You may not receive credit if you post an image greater than 250 kb

- About (3 pts)

-> Background and general information about the topic

- Accessibility (2 pts)

-> Questions to be addressed change depending on the topic but may include:

- *How and when can it be (or has it been) obtained and used?*

- *How and when can it be (or has it been) implemented?*

- *How available are the company's products?*

- Environmental Benefits (2 pts)

-> Postulate about potential environmental benefits of the alternative

- Source(s) of Information and Graphic (1 pts)

-> Use good sources (no wiki, blogs, etc.)

-> Style of source does not matter as long as the source can be located

-> Distinguish which source is for the graphic and which source(s) is/are for the information

- Information may be randomly checked for plagiarism

** Do not post on the same topic as someone else; however, you may post on similar topics.

Each comment needs:

- Total points = 5

- One additional fact about any post from another student

- Source of your fact

-> Use good sources (no wiki, blog, etc.); style of source does not matter.

Results

Student experience with the class wiki was assessed using an IRB approved survey two weeks after the assignment was due. In the MWF section of the class, students completed an additional wiki scavenger hunt questionnaire during a class period, while the TTh students did not complete the scavenger hunt. Results were analyzed to determine whether this was an effective assignment and whether students would view significantly more posts if given the scavenger hunt to complete. The class wiki has been used for several semesters and has accumulated hundreds posts spread among 14 categories. The majority of students taking the class in which the wiki was examined were Health Promotion and Behavior majors (50.7%), a major in which the course is required. Environmental Health majors made up 17.8% of the respondents, while 8.2% were taking it to satisfy a requirement for a Public Health minor, 2.7% were taking the class to satisfy an elective for a Global Health certificate, and 20.5% checked the "other" category on the survey. Students in the "other"

category may have been using the class to satisfy an upper level elective for a variety of majors across the University of Georgia.

First, to determine whether students wanted to apply existing knowledge to the wiki or research something new, they were asked, "Which of the following is true for your post to the wiki site?". The majority of students (67.1%) selected "I researched something new to me to share on the site", 32.8% selected "I shared something that I already knew about". Then, to determine whether they sought out a post that was familiar for their required comment, or whether they found a post of interest and then research their comment, students were asked, "Which of the following is true for the comment you posted on the wiki?" In this case, 54.8% of students chose "I researched something new to me for my comment", and 45.2% selected "I chose a topic with which I am familiar for my comment".

The overarching goal of the assignment was for students to share something (a product, activity, non-profit) that they could support as students or once they graduated and were in the workforce to become better environmental stewards. A set of yes/no questions was asked to address this. When asked, "Did you find anything on the site that you will use/do now?", 48% of students answered "yes" and 52% of students answered "no". A slight decrease in students potential to use information from the site in the future was found in the next survey question, "Did you find anything on the site that you will use/do in the future?". For this question, 42.5% of the students answered "yes" and 57.5% answered "no".

Also, in the survey were questions about the time it took for students to complete this low-stakes (15 points out of a total of 450 for the semester) assignment. Most students (64.4%) finished the assignment in less than 2 hours, 30% took from 2-4 hours to complete the assignment, two students took 4 to 6 hours, and one student spent more than 6 hours on the assignment.

Students from both sections were asked how many posts they viewed while working on the assignment. Most students (49%) viewed 5 or fewer posts, 38% viewed from 6 to 10 posts, 9.6% viewed from 11 to 20 posts, and 1 student viewed more than 20 posts.

Discussion

Low stakes assignments have been used in many disciplines and lend themselves to quality, creative, assignment submissions and test scores (Brown & Gaxiola, 2010; Elbow, 1997). This work found that student low stakes assignment posts to the class wiki that were viewed by their instructor and peers were high quality (based on grading rubric), likely due to the multi-faceted scrutiny in the assignment design. Posts were viewed while students searched the site to verify that their post topic was unique. Once the due date passed and the instructor and teaching assistant evaluated posts and gave feedback, a scavenger hunt activity was implemented in one section of the course to have students view additional posts. The amount of overall engagement outside of the search for duplicate posts and the scavenger hunt was low, as was found in another study that tried to use a wiki to support student engagement (Cole, 2009).



There were limitations in this study. First, 17 of the 93 students who were given the study did not participate. If those students had something in common with regard to the study questions, the data may have been different if they had participated. Second, the survey was not administered until two weeks after the assignment and scavenger hunt were completed. This was due to scheduling a day in which there was class time available to complete the survey. But the lag time may have decreases the accuracy of students' memory of the assignment and activity. And finally, this study was performed after only one semester in which the assignment was given and due toward the end of the semester. This is during a period of time when students are gearing up for final exams and their time dedicated to the assignment may have been different if the assignment and activity were scheduled a different part of the semester.

Overall, however, almost half of the students found s post that would direct environmental stewardship in their lives. Whether this was due to student attitudes or the utility of the site is unknown. But this data is similar to data from another study found that student attitudes about wiki assignments were mixed (Elgort, Smith, & Toland, 2008)and therefore may not excite the students about a topic.

Conclusions

Students in Environmental health science classes are often given general information on the issues in the environment, but they need to learn to critically think about these issues in order to incorporate relevant changes into their lives. The wiki assignment and associated classroom exercises presented here give students an opportunity to put their knowledge into practice. They must research eco-friendly alternatives or use existing knowledge to share the impact that switching to or using that alternative will make in consumers'/students' lives and the health of the environment. They must also share accessibility information and relevant sources for the alternative. In order to have students examine other alternatives posted to the site they must make a productive comment on another students' post and participate in the scavenger hunt development and scavenger hunt answer day classroom activities.

Student completion of the assignment was low stakes because it was worth 15 points out of a total of 450 points. However, all students completed the assignment, though some completed it late with a 5 point penalty. Of the students who turned it in, only a few did not earn all of the points, but in all cases this was due to the lack of completeness and not due to content. Therefore, participation was high.

The surveys also found that engagement was high and that about half of the students found something that they will use in their lives to be better stewards of the environment. Though there is room for improvement, this success rate is substantial, given that some of these alternatives are life long and lasting changes that reduce the strain on the environment. Less successful was the scavenger hunt activity designed to increase student views or their perceptions of how many views they had of their classmates' posts. In the future, other methods will be design to increase post views either by increasing the number of comments required for the assignment, or by developing a classroom activity that requires more peer review and post views.

Disclosure statement

The Authors reported that no competing financial interest.

Notes on contributors

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