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Using Wiki Contributions to Induce Collaborative Learning in a Psychology Course

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Wikis are informational websites which can be edited by any user. They are typically organized by content rather than chronology. Wiki technology has become extremely popular in recent years, generating websites such as Wikipedia.org. Despite their widespread popularity, Wikis are not frequently employed in the academic sphere. However, the use of Wiki technology in education is catching on. Their inherent cooperative nature makes the Wiki an ideal educational tool for inducing collaborative learning in a variety of courses. Recently, the author incorporated Wiki technology into a social psychology course with great success. Wiki technology was employed to encourage cooperative work and collaborative learning on a final class project. Students found the Wiki technology to be an engaging way to work on their final projects, and the quality of the projects benefitted from the inclusion of this method.

Keywords: Wikis, collaborative learning, student engagement, technology, college teaching

INTRODUCTION

Educators in college and university settings often seek new ways of efficiently communicating information in ways that are relevant to their students. Using new technologies in the classroom can help keep students engaged in material by making it accessible for them through a medium with which they are familiar and can enhance communication both among students and between students and educators. Of course, new technologies are only useful to the extent that they are adopted and integrated in ways that support educational objectives. Truly integrating new technologies into the classroom in order to close the "digital divide" between instructors and their students is the goal of many college and university educators (Engstrom & Jewett, 2005; Ferriter, 2002; Hooper & Reiber, 1995; Lamb 2004). The current article presents an argument for the true incorporation of one such technological tool, the Wiki, into the college and university classroom. The author discusses both the theoretical background of Wiki technology and a practical application of this technology into a course which the author

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recently taught. Finally, the author discusses several practical points regarding the incorporation of Wiki technology into higher education.

The current article aims to argue for the usefulness of Wiki technology in higher education, specifically as a tool to encourage collaborative learning and integration of course information. Specifically, Wiki technology was employed in a small special- topic psychology course to facilitate collaborative exchange of ideas and information on a final class project. In the past, encouraging students to collaborate on assignments required either that the instructor of the course allocate classroom time to working on a collaborative project or that students find time in their schedules—and coordinate schedules— in order to work outside of the classroom on a collaborative project. A major drawback of the first approach is that students are constrained by the classroom environment; a major drawback of the second approach is that the instructor is not present to aid students in their collaborative effort. Additionally, neither of these approaches is as time-efficient, for the instructor or the students, as they could be.

The small special-topic psychology course examined in the current article employed an often discussed Web 2.0 technology to facilitate collaborative learning on a final project: the Wiki. The use of Wiki technology was incorporated to aid the students in meeting two of the overarching objectives for the course: (1) working collaboratively to learn about interpersonal relationships, and (2) critically examining portrayals of interpersonal relationships in the media. Specifically, the nine students who were enrolled in a class on the psychology of close relationships were assigned a collaborative final project in which each student was required to write a single chapter for a "Relationships for Dummies" (Wachs, 2002) manual based on the information they had learned in the course. Students were asked to contribute background information to each others' chapters and to engage in a collaborative revision process of each others' chapters using Web 2.0 Wiki technology. The course itself and the specifics of the assignment are described in greater detail later in this examination.

This technology was not employed simply to be novel, but to facilitate the learning of the students in the course and thus meet the overarching course objectives. To these ends, the Wiki was useful in three specific ways: it was an engaging technology that students were familiar with and enjoyed using outside of the classroom, and thus could enhance student enjoyment and engagement in the course; it allowed students strive to meet the overarching objectives of the course by sharing their knowledge and collaborating on their assignment in an environment that was convenient for them; and, it allowed the instructor to moderate student contributions by commenting on shared information and correcting erroneous statements when necessary. Overall, the use of Wiki technology furthered the overarching course objectives and enhanced students' learning experiences by engaging them collaboratively with each other.

WHAT ARE WIKIS

The term "Wiki" derives from the Hawaiian phrase, "wiki-wiki," which means fast or quick (Parker & Chao, 2007). A Wiki is a website, typically organized by content rather than chronology, which allows for collaboration among users by permitting them to both add new information to and edit the existing information contained on the site (Chao, 2007; Engstrom & Jewett, 2005; Tonkin, 2005). As all users can contribute to the webpage, Wikis are ideal educational tools to facilitate not only the communication of information, but also the sharing and collaborative growth of knowledge. Because all users have the opportunity to contribute information, Wikis stand in contrast to standard websites and online blogs or journals in which the information on the webpage is

contributed solely by site administrator or author (Doyle, 2006; Parker & Chao, 2007; Tonkin, 2005).

The technological foundations of the Wiki emerged over a decade ago when a computer programmer, Ward Cunningham, aspired to design a webpage that anyone can edit (Chao, 2007; Evans, 2006). Wiki technology has become a major component of Web 2.0, the emergent generation of web tools and applications (Alexander, 2006), and has spawned many popular websites such as Wikipedia.org, an online encyclopedia, which has over 800,000 pages in English alone (Evans, 2006). Despite their widespread popularity, Wikis are relative new-comers to the academic sphere. However, the use of Wiki technology by instructors in both primary and higher education is becoming more common (Elgort, 2007; Parker & Chao, 2007). For example, Hughes and Narayan (2009) demonstrated that the use of Wiki technology in a college course predicted a more positive perception of the course by the students enrolled, as well as greater learning and information retention (compared to students enrolled in a similar course which did not use Wiki technology). The use of Wiki technology in Web 2.0 has the potential to complement, enhance, and add new collaborative dimensions to the classroom.

Wikis have the additional advantage of offering a great deal of flexibility in how they can be used in an educational setting (Duffy & Bruns, 2006; Parker & Chao, 2007). Wikis can help students meet a variety of course objectives. Students and instructors can use Wikis to brainstorm ideas, promote class-based discussion in an online format, plan projects, or present cumulative project materials (Boulos, Maramba, & Wheeler, 2006; Duffy & Bruns, 2006; Parker & Chao, 2007). Wikis can also aid instructors in tracking students' progress on projects, shaping online discussions, communicating information such as syllabi or course content to students, and correcting erroneous information should it appear (Lund & Smordal, 2006). Recent research demonstrates that Wiki technology can help to meet these various classroom objectives in settings ranging from distance learning to in-person software design and engineering classes (Chao, 2007; Duffy & Bruns, 2006).

WIKIS AND COLLABORATIVE LEARNING

Perhaps the most promising aspect of the Wiki is its ability to enable collaborative learning. In collaborative learning, students work together to support each others' individual learning (Bergin, 2002; Parker & Chao, 2007; Tsinakos, 2006). Collaborative learning enhances students' interdependence within their work group as well as their individual accountability for completing their work (De Pedro Puente, 2007; Johnson, Johnson, & Smith, 1998; Schaffert et al., 2006). Collaborative learning is also essential for facilitating the distribution and sharing of knowledge and expertise among a group of individuals (Augar, Raitman, & Zhou, 2006; Cochrane, Brodie & Pendlebury, 2008; mKnobel & Lankshear, 2009; Schaffert et al., 2006; Tsinakos, 2006). Importantly, college students who engage in collaborative learning efforts retain the learned information longer than similar students who complete their work alone (Hughes & Narayan, 2009; Johnson & Johnson, 1986; Johnson, Johnson, & Smith, 1998).

Writing a Wiki is an inherently cooperative effort since all students can contribute insights on a given topic. All students can potentially act as authors on a Wiki page, or can serves as administrators of one of several Wiki pages. This makes Wikis especially well-suited for encouraging collaborative learning. Wikis are also promising because they involve the incorporation of technology that has already been adopted by students in their everyday lives (Augar, Raitman, & Zhou, 2006). Students can use Wiki technology in a variety of cooperative ways from holding group discussions, to the collaborative editing of writing assignments or final projects.

A CLASSROOM APPLICATION OF THE WIKI TO INDUCE COLLABORATIVE LEARNING

In the course described at the beginning of the current manuscript, which covered varying aspects of the psychology of interpersonal relationships, the author employed Wiki technology as a collaborative learning tool during the course's final project. The class itself was a small, upper level, special-topic course (9 students). The two overarching objectives for the course were (1) for students to learn to work collaboratively as a group, thus learning about interpersonal relationships in a direct way, and (2) for students to critically examine media portrayals of interpersonal relationships in light of the information learned in the course. Thus, for a final project, students were assigned the task of putting together their own version of the popular self-help book, "Relationships for Dummies," (Wachs, 2002). Each student chose a topic covered in class and wrote a five page chapter for the class' book. Topics ranged from initial attraction in romantic relationships to conflict and relationship dissolution, so students had a wide variety of relationship themes from which to choose. Their task was to distill the information learned in class and from their textbook (Miller & Perlman, 2009) on their assigned topic into a guide for others to follow. They were told to imagine that they were trying to teach their selected topic to someone who had not take the close relationships course and knew very little about the psychological study of close relationships. A central goal of the final project was for students to incorporate common media examples from music, movies, television, books, or magazines to accurately illustrate concepts from the course, consistent with the course objective of encouraging students to critically examine non-academic portrayals of close relationships.

Although the students wrote the final versions of their projects individually, the development of each book chapter was highly collaborative. This collaborative component was designed to teach students directly about interpersonal relationships in the classroom. Thus, the project incorporated two different uses of Wiki technology. First, on the designated course website, the instructor set up a Wiki page for each of the topics chosen by students as the theme of their chapter: Major Theories of Relationships, Initial Attraction, Sexuality, Falling in Love, Cognition in Relationships, Relationships and the Self, Conflict in Relationships, Surviving Breakup, and Maintaining Relationships Long-Term. Each student was responsible for maintaining the Wiki page associated with his or her topic as an administrator. This included clarifying unclear information posted to the pages as well as verifying the correctness of all information. Additionally, all students in the class were responsible for contributing at least one annotated media example to the Wiki for each topic. In this way, all students contributed to each other's "Relationships for Dummies" chapters by providing media illustrations of concepts relevant to each topic. Students were also required to annotate each of their examples; that is, they had to describe how the media illustration was relevant to the topic at hand. Students provided media examples primarily from movies and television shows, as in the example below, which was provided as an illustration of different conflict styles in romantic relationships:

> In terms of conflict in close relationships, there are four types of couple conflict styles: hostile, volatile, avoidant, and validating. One good example of a volatile relationship is the one formed between the two main characters of "Brokeback Mountain" (McMurtry & Ossana, 2005), who, despite their best efforts, fall into a forbidden love. The two men are extremely emotional and volatile, occasionally even going straight from arguing and physically fighting with each other, to making love.

> Their arguments are frequent and passionate, but their positive interactions are also very passionate. Our text book tells us that couples who have volatile conflict styles can maintain satisfied relationships. Their high level of positivity helps to balance out the negativity of their conflicts.

The student writing the chapter on a given topic could incorporate the examples provided by his or her classmates into his or her chapter, which was his or her final project for the course.

As there were nine students enrolled in the course, each topic had at least nine examples contributed to it (one per student). For four of the nine topics, at least one student contributed more than one example; and, the maximum number of examples contributed was twelve for the topic of "Falling in Love." For three of the nine topics, the examples provided prompted further discussion and clarification among the students. This online discussion of the examples provided for the various topics was an additional, if unintended, collaborative aspects of employing Wiki technology for the students' final projects. Therefore, this first collaborative aspect of the Wikis allowed students to gather information for their project from multiple sources while evaluating the relevance of various media examples to their chosen project topic, as well as allowing all members of the class to elaborate upon and discuss the various examples provided.

A second collaborative aspect of the project involved the development of the structure of each of the individual chapters. Each student was asked to post an annotated outline of their chapter on the relevant Wiki page for their topic at least one week before the final version of the chapter was due. All of the students in the class were then asked to review each others' outlines and comment upon (1) at least one positive aspect of the proposed chapter, and (2) at least one aspect of the proposed chapter that could be improved or clarified. This second collaborative aspect furthered the students' involvement in each others' work and allowed them to collectively edit the content and structure of the individual chapters that would be included the final version of the class book.

By using Wikis to encourage collaborative learning, all students worked together to help with the creation of each other's individual book chapters for the class project. The students all actively engaged in using the Wikis and all of the students' final projects incorporated examples that had been generated and discussed on the relevant Wiki page. Additionally, many of the students went beyond the assignment by contributing multiple media examples per Wiki page, or by using relevant examples to spark discussions both in the classroom and on the Wiki pages themselves. These unexpected benefits of using Wikis further underscore the usefulness of this technique for inducing collaborative learning. This collaborative learning fostered deeper processing of critical thinking regarding course content.

Not only did the inclusion of Wiki technology in the final project of the course serve the learning objectives of the course itself, it also made for a more positive learning experience for the students. In the final course evaluations, students responded to several questions that assessed their experience with the Wikis employed in the course. All survey questions were answered on a scale of *1* (not at all) to *6* (very much). The survey items and the mean student responses are presented in Table 1. Overall, students reported that they (a) found the Wikis useful in writing their final papers, (b) thought that the Wikis were unique, (c) thought that the Wikis were fun, and (d) thought that they had learned from using the Wikis.

In addition, students were also given a "Comments" field in which they could enter any other comments or thoughts that they had regarding the course. In this free response section, seven of the nine enrolled students spontaneously generated positive comments

regarding the use of the Wikis in the course. For example, two of the students thought that the Wikis were "a truly unique and fun way of work on our final project," and that "it was a nice change to get to work on the final project together, [I] feel that I learned a lot more since I was able to get other people's opinions on my work."

Table 1. Students Mean Response of Using Wikis on the Final Course Evaluation

Survey Items	Mean (n = 9)	Standard Deviation
How useful were the Wiki contributions completed by your peers in helping you write your final paper?	4.50	0.92
How unique was the use of the Wikis in this class? (i.e., was this the first time you've used Wikis?)	5.50	0.78
How much did you enjoy the use of Wikis in this class?	5.00	0.99
How much did you learn from using Wikis in this class?	4.75	1.22

Finally, the instructor followed up with the nine students from the Close Relationships course via email six months after the course had concluded. Students were asked to give a short answer to the open ended question of "How do you think the use of the Wiki pages for your final project has impacted you since the Close Relationships course ended?" Eight of the nine students responded to this email. Sample answers to the open ended follow-up question included:

> I think that using the Wikis raised my expectations for final projects in courses. I really enjoyed working with my fellow students and felt that my paper was vastly improved by the feedback I received from the Wiki. I hold the projects in the courses I am in now to this standard of collaboration.
>
> I learned a lot from using this technology. I didn't that consider Wikis could be used in courses like this. I still remember a lot of the information that I included in my final paper, and I don't think that would be the case if we hadn't used the Wiki to discuss our ideas as a class.

Responses to the follow-up email to the students indicated that students not only enjoyed using the Wiki pages but had their learning experiences enhanced by them. Students reported remembering information from their final project six months after the course concluded, as a result of the information being collaboratively discussed by classmates on the relevant Wiki page. The use of Wiki technology allowed students to synthesize and integrate the information from their final projects in meaningful ways.

REFLECTIONS AND SUGGESTIONS TO INSTRUCTORS

Taken together, both previous research (Chao, 2007; Cochrane et al., 2008; Duffy & Bruns, 2006; Engstrom & Jewett, 2005; Johnson, Johnson, & Smith, 1998; Parker & Chao, 2007) and the author's own classroom experiences indicate that Wikis can be an invaluable tool in college or university courses. Wikis can be used to achieve a variety of course objectives and across a variety of classroom topics and structures; however, the author believes that their greatest strength lies in their ability to encourage collaboration and cooperation among students. Collaborative learning promotes positive student

engagement and interaction in their education and allows them to develop a deeper understanding of course material through the sharing and discussing of each others' thoughts (Boulos, et al., 2006; Hughes & Narayan, 2009; Johnson & Johnson, 1986; Schaffert et al., 2006; Tsinakos, 2006). Additionally, consistent with the student feedback for this course, collaborative learning promotes student enjoyment of assignments (Hughes & Narayan, 2009). Wiki technologies can be effectively used to facilitate such collaborative learning, thus capitalizing on novel technologies familiar to, and popular with, college-aged students to help them attain course objectives. In the case of the psychology course on close relationships, students' final projects benefitted from the Wiki-based collaborative process used to create them and the students reported enjoying the process of creating their final project more due to its collaborative nature.

Wiki technology was employed in the above discussed practical example to induce collaborative learning in a small, advanced, content-based course. However, Wikis are not limited to this type of usage. Other research has demonstrated that Wiki technology can be generalized to a variety of different course objectives, such as facilitating group discussions, both inside and outside the classroom, completing ongoing group projects such as homework assignments, brainstorming ideas for assignments, or presenting final project materials (Barton, 2004; Duffy & Bruns, 2006; Parker & Chao, 2007). An additional use of the Wiki, which is not directly tied to the mastery of course content, but may still serve course objectives is that, by helping to administer and manage Wiki pages, students learn how to synthesize and organize information, a skill which is vital to their future success.

These various goals that can be met via the usage of Wiki technology can generalize beyond the small, advanced course discussed in the current example. Wikis can be used across a variety of course topics and structures. For example, Wikis have been used in large, lecture-based engineering courses to allow for group work on homework problem sets, as well as in completely online, distance-learning courses (Chao 2007). Indeed, the online format of Wiki technology may make it an especially viable portal for sparking discussion between students in a complete online course.

Additionally, course size is not a limiting factor to the use of Wiki technology. As previously discussed, Wiki technology is extremely flexible. For example, instructors could certainly adapt the example used in the current manuscript to a medium or large sized course by creating a set number of topics, instead of one per student, and allowing multiple students to write a final paper on the same topic. Students could be asked to provide feedback on the Wiki pages for the other papers written by their fellow students on the same topic. In this way, the collaborative approach outlined in the current example could be adapted to a larger classroom setting.

The size, structure, or content of a course should not be a limiting factor the employment of Wiki technology. Factors that may limit the ability of educators to use Wikis in their courses may include student access to computers or the Internet, or student age. Wiki technology is likely to be most useful for students who already have basic communication, writing, and computer skills.

When deciding whether or not to include a Wiki-based aspect into a course, instructors must consider the abilities of their students, the format and content of their course, and how their existing course objectives could be served by being integrated into an online, collaboratively created and edited format. They can then adapt their assignments involving Wiki technology to reflect both the ability levels of their students, the practical constraints of the course they are teaching, and their overarching objectives for the course to maximize the benefit to the students of employing Wiki technology.

Some educators may feel daunted by the task of incorporating unfamiliar technologies into their courses or concerned about their ability to regulate the veracity of

information that students would post on Wiki pages. Thankfully, Wiki technology is relatively user-friendly as it is based on a text format for editing (e.g., Tonkin, 2005). Thus, no special computer programming skills are necessary. Online space to create a Wiki page, or set of pages, can be obtained for free from websites such as Wiki.com. Additionally, some institutions, including the university at which the author taught the previously discussed psychology course, already support Wiki technology on their designated course websites. Finally, since Wikis can be edited by all users, course instructors can monitor the content being posted by students and correct any erroneous information (Doyle, 2006; Chao, 2007; Duffy & Bruns, 2006). Although this does require some vigilance on the part of the instructor, the extra effort is worth the boost in student learning and enjoyment obtain by using collaborative methods such as the Wiki.

Instructor involvement in the usage of Wiki technology is a topic for some debate, and is largely beyond the scope of the current investigation. However, when deciding whether to utilize Wiki technology, instructors should consider, in addition to the course objectives to be served by using a Wiki, the role they want to play in their students learning. Peer learning and collaboration may require educators to take a relatively hands-off approach to students' use of course Wiki pages. In the current example, the instructor monitored the Wikis set up for each final project topic for incorrect information or usage (i.e., not posting an example for a topic, being off topic, or posting crude remarks) but did not contribute directly to the information posted by the students or otherwise alter the students' usage of the technology. In contrast, if an instructor wished to use Wiki technology for projects such as group homework assignments, he or she might be more involved with giving constructive criticism or feedback via the Wiki used for the project. Instructor involvement in the use of Wiki technology can be as flexible as the projects and settings that the technology can adapt to and is a decision that should largely be left to the individual educator to be made on a course-by-course or project-by-project basis.

CONCLUSIONS

In this increasingly technology-based world, educators must make an effort to move forward with the time. The incorporation of Wikis to encourage collaborative learning represents one way in which we, as educators, can attempt to close the "digital divide" between ourselves and our students. Specifically, in the current classroom application, using Wiki technology enabled the students to work collaboratively, while being monitored by the instructor, without encroaching on the instructor's classroom time. This allowed students to work together in a manner that accommodated all schedules. Additionally, the use of Wiki technology to induce collaborative learning encouraged students to critically examine their own and media perceptions of interpersonal relationships, as well as to complete their class projects in the direct context of working interpersonally. These factors contributed to the students' enjoyment of and engagement in the class, in addition to facilitating the overarching objectives for the course by promoting shared learning and collaboration. Future work could extend the findings from the current application of Wiki technology to investigate other classroom settings or applications that could be benefited by employing the Wiki, as well as the potential limitations of the Wiki in educational settings. Taken together, the online, inherently collaborative technology of the Wiki can be adapted to serve many course objectives across a variety of course topics, sizes, and structures. Incorporating such technologies can provide educators with a new way to help students achieve a variety of course objectives, often with positive consequences for both student learning and engagement.

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