
Wikis as a Student Collaborative Tool

Donna R. Everett
Morehead State University
College of Business
150 University Blvd., Box 868
Morehead, KY 40351-1689 USA
d.everett@moreheadstate.edu
606-783-2718

Abstract

Wikis are one of many Web 2.0 components that may be used to enhance the teaching and learning process. A wiki is a web communication and collaboration tool that can be used to engage students in learning with others within a collaborative environment. This paper expands on wiki usage, reviews current literature on wiki use in education. It presents the results of a pilot application of a wiki as a student collaborative tool in a required Business Communication class to determine if a wiki will improve student performance (grades).

Keywords: wiki, Web 2.0, collaborative learning, computer-mediated communication, e-learning, pedagogy, education, constructivism

1. INTRODUCTION

The Hawaiian phrase, wiki-wiki, means swift, quick. A wiki then is web site, allowing users with one click to quickly access, create, and edit web pages collaboratively.

Web 2.0 technologies, such as blogs, Twitter, wikis, podcasts, and RSS (Really Simple Syndication) feeds have been dubbed 'social software' because they are perceived as being especially connectible, allowing users to develop Web content collaboratively that is open to the public (Alexander, 2006). Social networking software offers a variety of unique and powerful information sharing and collaboration features, acting as cognitive reflection and amplification tools, and aiding the construction of meaning through the act of self-design of knowledge databases (Jonassen, Peck, & Wilson, 1999). Wikis in particular actively involve learners in their own construction of knowledge (Boulos, Maramba, & Wheeler, 2006; Liu & Olson, 2010). Social software helps to realize the original vision of the Web as a space in which anyone

can participate (Schaffert, Gruber, & Westenthaler, 2006).

Further, these tools afford the added advantage of reducing the technical skill required to use their features, allowing users to focus on the information exchange and collaborative tasks themselves without the distraction of a difficult technological environment (Kirkpatrick, 2006). Wikis in the workplace are capable of transforming the nature of communication on a global basis by providing a means to collaborate (Nations, 2011).

A wiki also provides tools that allow the user community to monitor the constantly changing state of the wiki and discuss the issues that emerge (Parker & Chao, 2007). The Parker and Chao article provides a strong research foundation for wikis as teaching and learning tools, utilizing an extensive bibliography of wikis and collaborative writing.

Some wikis restrict access to a group of members, allowing only members to edit page content although everyone may view it. Others

allow completely unrestricted access, allowing anyone to both edit and view content (Olson, 2006). Wikis allow visitors to engage in dialogue and share information among participants in group projects or to engage in learning with each other by using wikis as a collaborative environment in which to construct their knowledge (Boulos, et al., 2006).

This paper will focus on a specific use of wikis, as well as provide a brief look at learning approaches that can be furthered through wikis. It will then present findings from actual classroom use of a wiki to enhance collaboration and learning in an online Business Communication class.

2. REVIEW OF LITERATURE

Many of the papers that deal with wikis in education indicate how a wiki supports a particular approach to learning. The most commonly listed learning paradigms are the cooperative/collaborative learning paradigm and the constructivist paradigm. These approaches are covered briefly here.

Cooperative/Collaborative Paradigm

As noted, wikis are characterized by a variety of unique and powerful information sharing and collaboration features. In cooperative learning, students work in heterogeneous groups to support the learning of their individual members. Cooperative learning leads to positive interdependence of group members, individual accountability, face-to-face interaction, and appropriate use of collaborative skills (Schaffert, Bischof, et al., 2006). Cooperative teams achieve higher levels of thought and retain information longer than students who do their work individually (Johnson and Johnson, 1986). The collaborative features of wikis make them particularly well suited for cooperative learning environments (Schaffert, Bischof, et al., 2006).

Wikis can be used to facilitate computer-supported collaborative learning, i.e., the development of collaboration by means of technology to augment education and research (Augar, Raitman, & Zhou, 2004). This enhances peer interaction and group work, and facilitates sharing, empowering, and distributing knowledge and expertise among a community of learners (Lipponen, 2002). Technology itself does not solve the challenges of learning and collaboration. However, collaborative technology can be used for other purposes than

for supporting collaboration; it can easily be applied in transmitting and delivering knowledge. Wikis enhance asynchronous communication and cooperative learning among students, and promote cooperation rather than competition (De Pedro, et al., 2006).

Collaborative learning becomes even more powerful when it takes place in the context of a community of practice. A community of practice consists of people engaged in collective learning in a shared domain. Thus, learning becomes a collaborative process of a group. Wikis can serve as a knowledge platform where members of the community can share their knowledge with the group, put up interesting pieces of information, work together, discuss issues, etc. (Schaffert, Bischof, et al., 2006). Wikis are characterized by some of the elements fundamental to a successful community of practice, including a virtual presence, a variety of interactions, easy participation, valuable content, connections to a broader subject field, personal and community identity and interaction, democratic participation, and evolution over time (Schwartz, Clark, Cossarin, & Rudolph, 2004). Technology that can be used to enhance the human factor and overcome the feeling of isolation in online learning should add immeasurably to student learning and motivation.

Constructivist Paradigm

Constructivism recognizes knowledge and meaning as 'constructed' rather than as given. Constructivism itself does not suggest a particular pedagogy, but rather describes how learning happens. Miers (2004) provides a cogent summary of constructivism that should engage students in meaningful learning. He notes critical features of constructivism, such as

- Active and manipulative
- Constructive and reflective
- Intentional
- Authentic, challenging and real-world
- Cooperative, collaborative, and conversational (p. 4).

In recent years, those involved in online learning have had a growing awareness of the benefits of constructivist online learning environments (Seitzinger, 2006). Hence, the recent interest in wikis in education. Constructivism is approached from a variety of perspectives in wiki research, including

reflective activity and communal or social constructivism.

Social constructivists believe that we learn by social and communal activities. Meaning is shaped and knowledge constructed through discussion with peers and teachers, and through reflection (Higgs and McCarthy, 2005). The collaborative nature of wikis means that they enact knowledge building with and for others, with the focus being on the community rather than on the individual learner. Wikis are one of the success stories in the world of social constructivism since they can be rapidly deployed and students can be very quickly operational (Notari, 2006).

Current State and Use of Wikis in Education

A literature search reveals the current state of the wiki education. There are a variety of applications, primarily in writing assignments, group projects, and online/distance education, although innovative uses in other areas can be found as well.

Several papers present a list of uses for wikis in the classroom, along with a discussion of each in most cases. Mader's site (2006b) focuses solely on wikis in education, citing uses such as simple web page creation, project development with peer review, group authoring, tracking group projects, data collection, and class/instructor reviews. His online text (Mader, 2006a) contains writings by several authors discussing such topics as integrating a wiki in instruction, collaborative writing projects, group wiki projects, using wikis within course management systems, constructing science knowledge, and wiki-based collaboration and academic publishing.

Wikipedia's (2011) School and University Projects page suggests uses of wikis in the classroom to provide students with exercises editing and publishing content on Wikipedia.

Secundo and Grippa (2010) report on a model developed in an international master's program that showed promise in applying Web 2.0 tools in a general way to support learner competencies and skills. Wankel's volume in Research in Management Education and Development series (2010) illustrates how Web 2.0 tools meet the needs of the net generation by affecting student learning, enhancing curriculum design, and enhancing critical

thinking skills and deep learning.

Writing Assignments

Perhaps the most common pedagogical application of wikis is supporting writing instruction (Lamb, 2004). Using a wiki as a writing tool maximizes the advantages of reflection, reviewing, publication, and of observing cumulative written results as they unfold (Fountain, 2005).

Lamb (2004) reports on the use of a wiki in an English class and lists a number of the medium's strengths for the teaching of writing skills:

- wikis stimulate writing ('fun' and 'wiki' are often associated);
- wikis provide a low-cost but effective communication and collaboration tool (with an emphasis on text rather than software);
- wikis promote the close reading, revision, and tracking of preliminary work;
- wikis discourage 'product oriented writing' while facilitating 'writing as a process'; and
- wikis ease students into writing for a wider audience (p. 5).

Forte and Bruckman (2006) discuss the writing-to-learn paradigm and how to engage students in collaborative writing activities. They investigate how to design wiki publishing tools and curricula to support learning among student authors, and suggest that collaborative publishing on a wiki offers an interesting model for creating authentic classroom writing activities and can be a powerful tool for constructing knowledge.

Kumar (2009) focuses on collaborative writing methods and the requirements of tools used with special consideration of wikis. His goal was to test the effectiveness of the proposed design for collaborative learning and for the development of a knowledge-building community driven by wiki participants.

Schaffert, Bischof, et al. (2006) discuss the concept of collaborative creative writing, in which a wiki serves as an interactive writing book, allowing students to collaboratively write an essay or story. Such collaboration offers numerous opportunities. For example, a story may have more than one ending, or it could even branch out like a tree based on different twists and conclusions. More artistically inclined students could supplement the story

with illustrative figures or images.

Scardamalia and Bereiter (1994) speculate that one of the key drivers of collaborative writing may be dissatisfaction in interplay. If students do not like what they see, such as the approach taken by others, they may be more inclined to participate in order to propose an alternative approach. De Pedro, et al. (2006) discuss one of the drawbacks of writing documents collaboratively. Students must be able to overcome their reluctance to allow others to see their unfinished working documents, and must be willing to let others contribute changes.

Online/Distance Education

A Sloan Consortium study (2010) shows a sharp increase in the number of students taking online courses, reporting that:

- The 2010 Sloan Survey of Online Learning reveals that enrollment rose by almost one million students from a year earlier. The survey of more than 2,500 colleges and universities nationwide finds approximately 5.6 million students were enrolled in at least one online course in fall 2009, the most recent term for which figures are available.
- The 21% growth rate for online enrollments far exceeds the 2% growth in the overall higher education student population.

These statistics alone make a strong case for the use of social interaction tools that engage, enhance, and motivate students to participate in creating their own learning experience. Further, wikis are a useful tool for facilitating online learning groups, supporting the dissemination of information, enabling the exchange of ideas, facilitating group interaction and creating a set of documents that reflect the shared knowledge of the learning group (Augar et al., 2004).

Both Byron (2005) and Tsinakos (2006) discuss their use of wikis in distance learning classes, the former in a distance learning symbolic logic class and the latter as an environment for the formation of collaborative student models during distance education sessions. Icaza, Heredia, and Borch (2005) detail the use of a wiki in an online graduate course using a pedagogical approach called project oriented immersion learning. Students were immersed in the environment of a fictional online publishing house that hires them to develop e-books, tutorials, and websites online. Seitzinger (2006)

provides a thorough discussion of the benefits of constructivist online learning environments.

3. DESCRIPTION AND METHODOLOGY OF STUDY

As Judd, et al. (2010) stated in their study of wikis as collaborative tools, even though wikis include features that are designed to facilitate collaboration, it does not necessarily follow that their use will ensure or even encourage collaborative learning behavior. Therefore, this study sought to determine if a wiki would enhance students' knowledge base of written communication through collaboration. A class wiki was set up to run for 8 weeks of a 16-week semester in fall 2010. Twenty-nine students were enrolled in the class and received points for participating in the assignment. The following questions guided the study and were the basis for the findings:

1. Will students participate in the wiki for the entire 8 weeks? Is students' interest sustainable?
2. Will students' grades be increased when compared to grades of students in two previous online Business Communication classes that did not have the benefit of a wiki?
3. What comments did students have about using the wiki at the beginning of the 8 week assignment and what comments did the students provide in a survey at the conclusion of the assignment?
4. Will students' knowledge of the content be enhanced with participation in a wiki?

The goals of the junior-level, required Business Communication class is to introduce upper-division students to current principles and practices of business communication that stress human relations, ethics, demographic diversity, and global and cross-cultural communications. Attention is given to planning, composing, evaluating, and analyzing business letters, short documents, memoranda, electronic messages, resumes, and informal reports. Emphasis is on techniques for achieving clarity, brevity, and effectiveness in written business communication.

To achieve these goals, written class assignments included creating business documents, such as good news, bad news, persuasive messages, informal reports, and email. Three of the wikis focused on rewriting

sentences to achieve brevity and clarity; these exercises are designed to lead up to using these skills to create professional business communications. This class is very writing intensive with 14 required written assignments each worth 100 points each.

Weekly writing assignments were presented to the students using the *SoftChalk™ LessonBuilder* v6 tool in Blackboard so that assignments were laid out logically and clearly for the students.

This study used a quasi-survey research design to explore student perceptions of a wiki and its value as a learning and collaborative tool. In accordance with qualitative methods, research participants were selected using purposeful sampling—all students enrolled in the online class included; these students were set up in partners of two or three (13 partner groups) by the instructor and given access to the Business Communication wiki, using pbworks.com, a free wiki tool for teachers. Partners were required to participate weekly in the 8-week long wiki based on specific writing assignments. The first wiki (labeled Wiki 1) introduced students to wikis via a YouTube video and a short PowerPoint presentation. The comments from Wiki 1 were used as the basis for the end-of-course online survey instrument. Results and comments are presented in the Findings section.

4. FINDINGS

Findings from the four analyses (content, sustainability, grade analysis, and survey results) used in this study are presented below. Before presenting any of the results and to provide background of students’ experience with a wiki, 100% of the students said they had never used a wiki. After participating in the class wiki, 100% said they would like to see wikis used more often in their business courses.

Content Analysis from Wiki 1

The wiki’s intrinsic versioning and discussion capabilities were used to capture students’ online interactions with the wiki and each other. The assignment for Wiki 1 was to view a YouTube presentation and answer the following questions as partners: *How can teamwork be strengthened by using Wikis? Add your comments AS A TEAM.* Feedback on the survey after the class showed that 100% of the students found the YouTube presentation to be helpful. The presentation provided an excellent runway for the use of the class wiki. The

comments from Wiki 1 were analyzed for content and fell into the categories presented in Table 1 below.

Table 1: Categories of comments derived through a content analysis (n=27)

Category	Description
Reply	Comments in response to the question
Collaboration	Comments that showed the author was attempting to develop a shared understanding of collaboration and teamwork with his or her partner
Individual	Comments directed to a partner
Group	Comments directed to the group generally

In general, comments from 27 of 29 (93%) students in the class ranged from being a new wiki user, targeting comments to their partners or the group, seeing the collaborative and teamwork value for online learners, and expressing excitement about using the tool.

Sustainability

The next focus was on whether the 13 partner groups could sustain a high level of participation over the course of 8 weeks. Table 2 presents the results of sustainability.

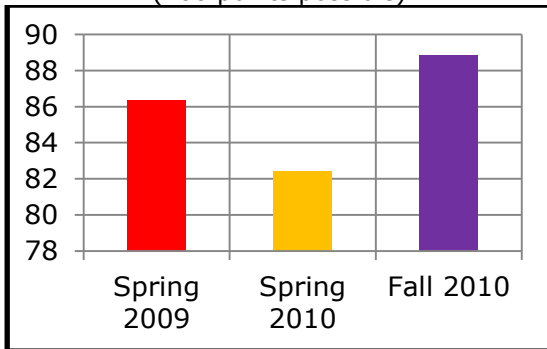
Table 2. Level of Sustainability

Group	Wiki 1	Wiki 2	Wiki 3	Wiki 4	Wiki 5	Wiki 6	Wiki 7	Wiki 8
1	X	X						
2	X							
3	X	X	X	X	X			
4	X	X	X	X	X	X		
5	X	X	X	X	X	X		
6	X	X	X	X	X	X	X	X
8	X	X	X					
9	X	X	X	X	X			
10	X							
11	X	X	X	X				
12	X							
13	X	X	X	X				
14	X	X	X	X	X			

Students in Groups 7 and 15 dropped the class. From the data presented here, only one partner group sustained participation during the 8-week period; six of the groups participated through Wiki 5; three of the groups participated through Wiki 6; the remainder of the groups (3) participated 1 to 4 times.

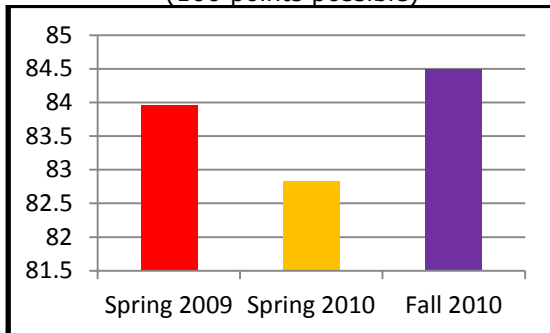
Grade Analyses. To determine if students' scores for the assignments in each of the 8 weeks increased or decreased by participating in the wiki, a comparison was made of aggregate scores of students in two previous online Business Communication classes was undertaken. Each chart below shows the weekly wiki impact on grades. Because of the low number of participants in the pilot study, only raw data are presented in the charts below.

Chart 1. Impact of Wiki 2: Letter (Increase)
 (100 points possible)



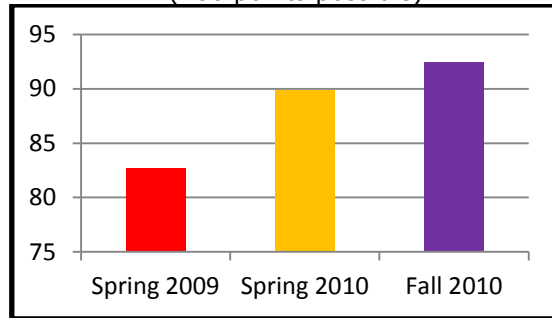
The data in Chart 1 showed that students who participated in the wiki did slightly increase their grades over students in previous semesters.

Chart 2. Impact of Wiki 3: Letter (Increase)
 (100 points possible)



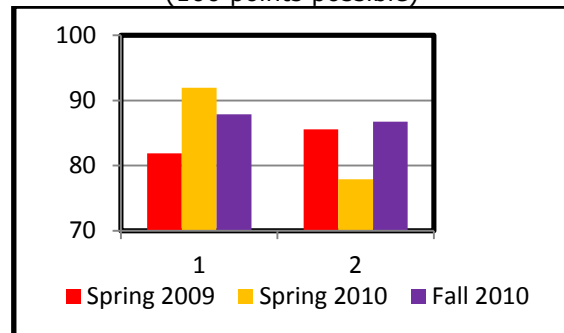
The data in Chart 2 showed that students who participated in the wiki did slightly increase their grades over students in previous semesters.

Chart 3. Impact of Wiki 4: Memo (Increase)
 (100 points possible)



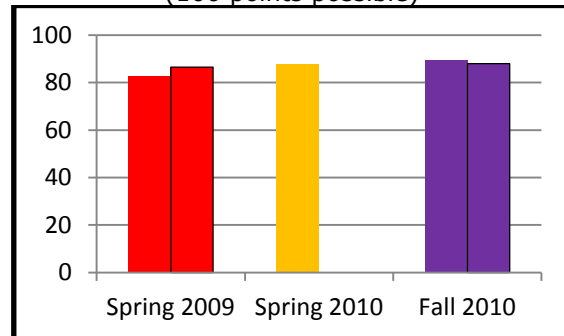
The data in Chart 3 showed that students who participated in the wiki did increase their grades over students in previous semesters.

Chart 4. Impact of Wiki 5: Letter (Decrease)
 (100 points possible)



The data in Chart 4 showed that students who participated in the wiki showed a decrease in their grades when compared to scores in other semesters.

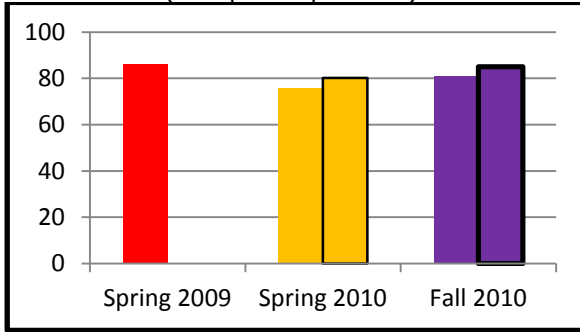
Chart 5. Impact of Wiki 6: Letter (Increase)
 (100 points possible)



The data in Chart 5 showed that students who participated in the wiki did only slightly increase

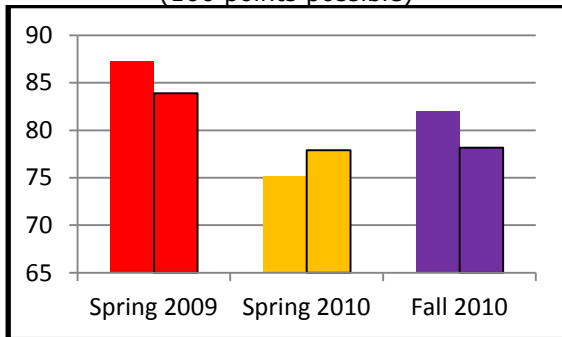
their grades over students in previous semesters.

Chart 6. Impact of Wiki 7: Letter (No Change)
 (100 points possible)



The data in Chart 6 showed that students who participated in the wiki had no change in their grades over students in previous semesters.

Chart 7. Impact of Wiki 8: Letter (Decrease)
 (100 points possible)



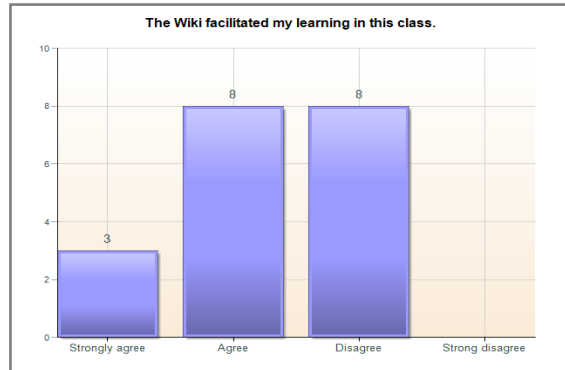
The data in Chart 7 showed that students who participated in the wiki had a decrease in their grades over students in previous semesters.

Summary. The data presented in Charts 1-7 showed that four (44%) of the weekly assignments showed an increase in earned points as compared to previous classes; two (22%) showed a decrease in scores; and one (11%) showed no change in grades.

Survey Analysis

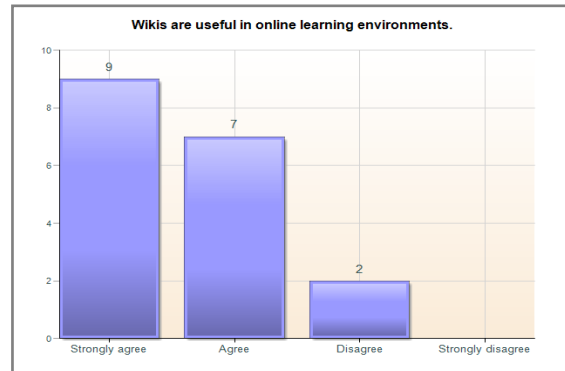
At the conclusion of the class, an online survey was sent to the students with a 65% response rate. Charts 8-11 present results from the survey. One of the questions in the concluding survey asked students if they had used a wiki before this class. All students (100%) said they had never used a wiki.

Chart 8. The Wiki facilitated my learning in this class
 n=19



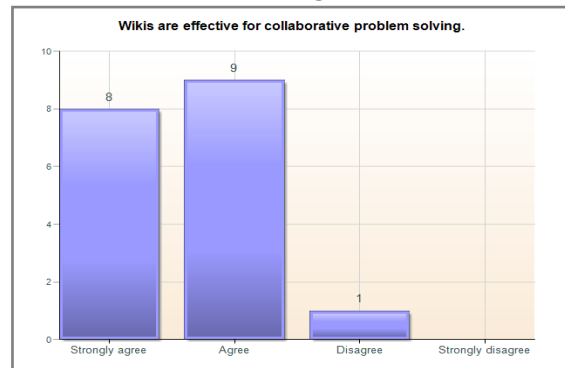
From Chart 8, data show that 11 (58%) responded strongly agreed or agreed that the wiki facilitated learning in this class.

Chart 9. Wikis are useful in online learning environments
 n=18



From Chart 9, 16 (88%) of the students agreed that wikis are useful in the online learning environment.

Chart 10. Wikis are effective for collaborative problem solving
 n=18



The data from Chart 10 show that students do agree (94%) that wikis are effective for collaborative problem solving.

Chart 11. I feel my grade was enhanced by working with my partner in the wiki
n=18

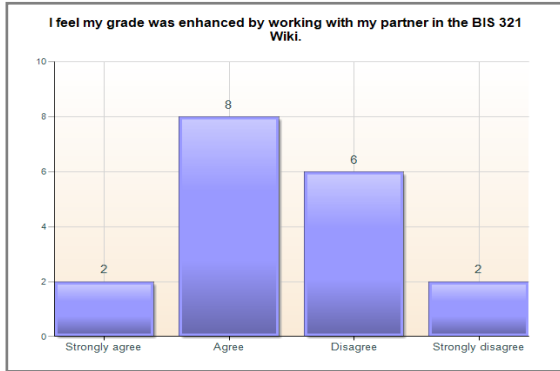
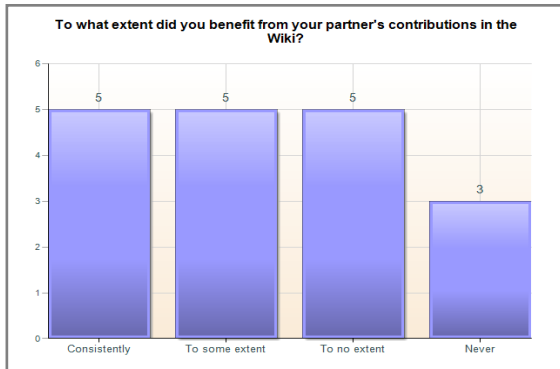


Chart 11 presented divided responses of whether the grade was enhanced by working with a partner: 55% agreed and 44% disagreed.

Chart 12. To what extent did you benefit from your partner's contributions?
n=18



Framed another way, students' responses to the extent to which they benefited from their partners presented the same results as in Chart 12: 55% showed benefit from consistent or to some extent; 44% said the benefit was from no extent or never.

When asked why they did not participate in the wiki, the response most often chosen by 66% of the students was *Rather than participating in the wiki, I just preferred to read what other people were writing.*

The final question on the online survey asked students to describe their experience with the wiki in one word. Table 3 shows the responses.

Chart 13. If you did not participate in the wiki, why?
n=20

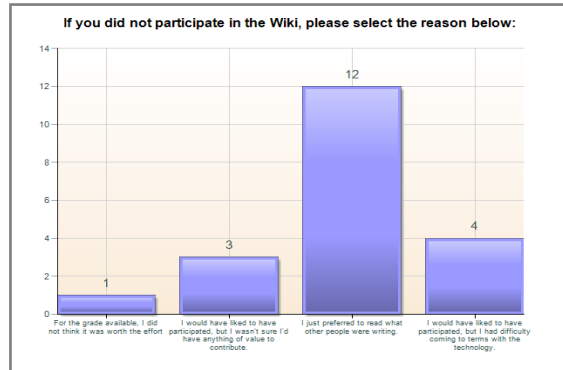


Table 3. Describe in one word your experience with the class wiki

1	intriguing
2	Meaningless
3	Helpful
4	sparse
5	it was very helpful!!
6	Helpful
7	Decent
8	Unproductive
9	Great
10	GREAT!!
11	poor
12	Unnecessary
13	Good
14	underutilized
15	helpful
16	irritating
17	useful when i didn't know what to do on a assignment
18	Educational

As shown in Table 3, seven (38%) of the 18 responses were negative; the other eleven (72%) responses were positive or neutral.

5. CONCLUSIONS AND RECOMMENDATIONS

The literature is replete with studies that show that wikis are beginning to fill a void in online learning and teaching practice as they enable extremely rich, flexible collaborations that have positive consequences for participants. For this reason, this pilot study was undertaken to determine whether wikis can be used to enhance collaboration and at the same time

enhance students' scores on a variety of written assignments. Several conclusions can be drawn from this study.

1. Since none of the students had used a wiki, the timing of the study seemed appropriate.
2. Wikis are an excellent collaboration tool as shown in student feedback. Whether they lead to increasing students' grades is not proven here.
3. Whether the purpose of a wiki should be to enhance grades may not be the correct use of a wiki.
4. Participation in a wiki was not sustained for the 8-week period of time. Most studies use the wiki for one assignment.
5. In this study, the data showed that four (44%) of the weekly assignments showed an increase in earned points as compared to previous classes; two (22%) showed a decrease in scores; and one (11%) showed no change in points.
6. The instructor may need to be more engaged during all 8 iterations of the wiki. Would this improve sustainability?
7. The one-word description of the students' experience with the wiki was positive.

Recommendations for the use of wikis as a student learning and collaborative tool are proffered here:

1. Engage the students more frequently during the period of usage through feedback and questioning.
2. Provide a shorter experience in time with wikis, since participation in the wiki may be time consuming. This depends on the purpose, however.
3. Ask what could have been done with the wiki to enhance learning or collaboration?

Collaborative creativity promises to be a key business skill in upcoming years. Educational institutions can offer immense value to their students by familiarizing them with the simple technologies that make collaborative networks possible. Today's students will not only manage business innovations of the future, but in many cases will drive them. Rather than being limited to today's skills, students must learn the skills of the future. Educators need to teach what wikis and other social software may mean to business, not just as a phenomenon, but also as a skill (Evans, 2006). By incorporating wikis into the classroom, educators can better prepare students to make innovative uses of

collaborative software tools.

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