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Student Collaboration in Hybrid Classrooms Using PBWorks: a Study of University Students in Najran, Saudi Arabia

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STUDENT COLLABORATION IN HYBRID CLASSROOMS
USING PBWORKS: A STUDY OF UNIVERSITY
STUDENTS IN NAJRAN, SAUDI ARABIA

A Dissertation Submitted in Partial Fulfillment
of the Requirements of the Degree of
Doctor of Philosophy

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College of Education and Behavioral Sciences
School of Educational Technology
Educational Technology

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This Dissertation by: Hadi Ali Almonuf

Entitled: *Student Collaboration in Hybrid Classrooms Using PBWorks: A Study of University Students in Najran, Saudi Arabia*

has been approved as meeting the requirement for the Degree of Doctor of Philosophy in College of Education and Behavioral Sciences in School of Education Technology, Program of Educational Technology-PHD

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ABSTRACT

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Modern classrooms are no longer always traditional, in face-to-face settings.

Many students take part in online classes and hybrid classes. Education technology has

made it possible for students to learn anytime and anyplace, which can be critical if

attending class is difficult. This quantitative study explored the use of the wiki tool

PBWorks for group collaboration in a hybrid setting. The participants were students from

two classes, each studying the same course with the same professor at the University of

Najran in Najran, Saudi Arabia. There were 21 students in the control group and 19

students in the experimental group ($N = 40$). Both classes were split into small groups for

collaborative projects, with the experimental group working online using PBWorks to

collaborate. The study explored if there were any differences in academic achievement

between groups and if there were any differences in students' attitudes toward

collaboration. The results indicated that, although both classes had similar improvement

academically, the experimental group improved at a faster rate. Both groups showed an

improvement in attitude toward collaborative learning, however, there was no statistically

significant difference between groups in pre- and post-survey or interaction between time

and attitude. There are implications related to this study the demonstrate using online

resources such as PBWorks can make a difference in how quickly students achieve

academically, can help students become more self-regulated learners, and transfer

educational experiences into their career experiences. Using online resources can be

valuable in emergency and stressful situations when attending traditional classrooms is

unmanageable, such as in war-torn areas.

Key words: Wikis, PBWorks, collaboration, education technology, hybrid class,

academic achievement

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INTRODUCTION

Statement of the Problem

The University of Najran was officially established in Najran, Saudi Arabia, in 2006. It has a current enrollment of 11, 917 students with 466 total staff (Kingdom of Saudi Arabia [KSA], Ministry of Education, Higher Education, 2015). Students at the University of Najran currently use Blackboard Learn for any online component of classes. Most classes have continued to use traditional teaching methods, which means mostly face-to-face. Najran is the capital city in the Najran province and is located on the southern border with Yemen. Currently, Houthi rebels hold the capital city in Yemen and are at war with Saudi Arabia and other gulf countries. The city of Najran has experienced mortar attacks and long range bombing by the rebels since March 2015 ("Saudi Arabia Escalates," 2015). Because of the danger this has posed, all of the schools in the southern part of the city have been closed and many people have been moved to the northern part of the city for their safety. Students have been unable to attend regular classes and the best alternative has been to encourage distance learning for those students who could not attend school, including university students. Unfortunately, many teachers and students have limited experience using the technology that would be needed to conduct classes in this non-traditional way.

As part of the push to encourage distance learning, there has been some research into the effectiveness of blended learning, which incorporates using platforms such as Blackboard with the regular face-to-face classroom (Al-Qahtani & Higgins, 2013; Alebaikan, 2012). Other research of education using Web 2.0 technology in Saudi Arabia has studied both student achievement and student attitudes (Al-Fahad, 2010; Alshumaimeri, 2011; Aqil, Ahmad, and Hussain, 2013). In Najran, a combination of war, lack of an understanding of technology, and instructors and students who have not been willing to try new technology have demonstrated a need for studying how using technology could improve education. Using the technology provided by Web 2.0 platforms, hybrid class environments could lead to an improved blended learning experience using wikis to provide a method for students to collaborate, which could improve student learning.

Definitions

Collaborative learning. Collaborative learning is based in constructivist theory, which explains that this is how students can learn from each other by working closely in groups (Milman, 2011).

Distance learning. Teaching students from a distance. Course instruction that does not take place within the classroom, such as lectures delivered by DVD or online. Before the introduction of computer technology, distance learning included correspondence courses. Also known as distance education (Moore, Dickson-Deane, & Galyen, 2011).

Hybrid class. A hybrid class is a class that uses some techniques of current technology
blended with the techniques of the traditional face-to-face classroom. Also
referred to as "blended learning" (Caraivan, 2011).

PBWorks. PBWorks is a Microsoft wiki that is free to use. The PB stands for peanut
butter, because the developers said this wiki was as easy to use as making a
peanut butter sandwich (Ibrahim, 2011). Although there are currently other wikis
available for use, PBWorks was chosen in an effort to replicate earlier studies
(Dewiyanti, Brand-Gruwel, Jochems, & Broers, 2007; Ibrahim, 2011).

Web 2.0. The term "'Web 2.0' was officially coined in 2004 by Dale Dougherty, a vice-
president of O'Reilly Media Inc., during a team discussion on a potential future
conference about the web" (Alzahrani, 2012, p. 1). Web 2.0 is the second
generation of the internet that made the internet interactive (Web 2.0, n.d.). Web
2.0 applications include wikis, blogs, social networking sites such as Facebook,
and Twitter.

Wiki. A wiki is a Web 2.0 application that can be defined as a collaborative Web space
where users can add and edit content to be published on the Internet (Adcock
&Bolick, 2011).

Purpose of the Study

The purpose of this study was to examine how students at Najran University,
in Najran, Saudi Arabia, experienced collaboration in different classroom
environments. Students taking part in collaborative activities in face-to-face classes
have often shown higher levels of academic achievement (Al-Fahad, 2010). This
study examined if students who used an easy to use wiki, in this case PBWorks, in a

hybrid class for the same collaborative activities would demonstrate different academic achievement than in the face-to-face classroom.

The study also examined any changes in students' attitudes toward participating in collaborative learning experiences. If students had a positive attitude toward collaborative learning in a face-to-face classroom environment, it was hypothesized that students' attitudes toward using PBWorks in a hybrid class for the same collaborative activities would be more positive than those of the students in the face-to-face classroom.

Research Questions

The variables of academic achievement are discussed in the methodology chapter, however, a pre-test/post-test was used to compare academic achievement levels as demonstrated by average grades. A survey instrument of 25 questions was used to determine pre- and post-attitudes toward collaborative learning as discussed in the methodology chapter.

Q1   Will students experience statistically significant differences in academic achievement after participating in collaborative activities in a hybrid class compared with students participating in collaborative activities in a traditional face-to-face classroom?

Q2   Will students experience statistically significant differences in attitudes toward collaborative learning after participating in collaborative activities in a hybrid class compared with students participating in collaborative activities in a traditional face-to-face classroom?

Hypotheses

H1   There will be no statistically significant differences in academic achievement for students participating in collaborative activities in a hybrid class using the PBWorks wiki compared with students participating in collaborative activities in a traditional face-to-face classroom.

H2   There will be no statistically significant differences in attitudes toward collaborative learning after participating in collaborative activities in a hybrid class using the PBWorks wiki compared with students participating in collaborative activities in a traditional face-to-face classroom.

Assumptions of the Study

It was assumed that students who collaborated would achieve higher grades and experience more agreeable attitudes toward the learning experience than would students in a traditional lecture-only learning experience. It was also an assumption that students who participated in online collaboration using a wiki and learning in a hybrid class would achieve scores that were at least as high if not higher than the traditional class and that students' attitudes toward collaborative learning would be improved. There were assumptions about students' ability to use computer technology and that all participants would respond truthfully to the questions. Since the teacher taught the same course for two classes in the same semester, it was assumed that the teacher taught equally and that the material covered was the same in both classes. It was assumed that teachers who were not familiar with the technology would be less willing to try teaching a hybrid course.

Significance of the Study

Some educators, parents, administrators, and students have needed to make drastic changes in the way they experience school because of the dangers they were facing on a daily basis. Although this was not a usual situation, it demonstrated the importance of having plans in place for managing distance learning or using blended learning to accommodate crisis conditions.

The Ministry of Education--Higher Education established the National Center for E-Learning and Distance Learning in 2007 to implement all forms of e-learning

throughout Saudi Arabia (Alebaikan, 2011). The King Khalid University in south-west Saudi Arabia introduced three types of e-courses in 2009: a supplementary level, a blended level, and an online only level. This was done as part of a 5-year strategic plan with the aim of making e-courses delivered in the blended mode at 10% of the entire curriculum (Alebaikan, 2011) Part of the difficulty in implementing plans with technology has included negative perceptions that more conservative families have about allowing Internet access. Another challenge was making sure the technology was supported by the Arabic language.

According to Aqil et al. (2013), Najran University already used Web 2.0 for Facebook, Twitter, YouTube, and RSS feeds for rapid information. As of 2013, the University had not adopted using wikis on Web 2.0 for students to create and manage their own work. Najran University has its own Facebook page which can be found at https://www.facebook.com/194489110567358 and have given back links of their University on Facebook profile. User name on Twitter is https://twitter.com/najranuniversity. However, the study indicated that wikis and blogs were not popular in Saudi's higher education. In addition to the purpose of the study, I wanted to introduce a blended-learning experience that used wikis as a collaborative learning strategy at the University of Najran. To do this, it was important to make sure the teacher and students understood all of the technology involved, including Web 2.0 and wikis--particularly PBWorks. It was also important that the teacher and students understood how collaboration works using wikis. The significance was that this method of teaching could enhance the level of technology that was already in place at the University of Najran.

Summary

Due to situations particular to Najran University, understanding how using technology could improve educational experiences was vital. Studying the effects of using one form of technology, such as how students could work collaboratively using wikis in a hybrid class format, could offer information to not only the University of Najran but to other colleges and universities around the world. Studying how technology could be effective in different situations could help universities decide on best practices for their students. Informing instructors and students of ways to use technology in distance learning could enhance their ability to decide if either hybrid courses or distance courses would work best. This study was intended to add to that discussion of educational technology.

CHAPTER II

REVIEW OF THE LITERATURE

Web 2.0

Web 2.0 would not be possible without Web 1.0. The World Wide Web, referred to as the web and sometimes called the Internet, is the part of the Internet that offers information to users. When the web was first created, it opened a new way for people to access many different kinds of information although interaction was mostly limited to read-only sites (Aghaei, Nematbakhsh, & Farsani, 2012). As technology improved, a newer, more powerful version of the web was made available. This version is known as Web 2.0. For users, the major difference between the two versions is the nature of interaction. Where Web 1.0 was read-only, Web 2.0 offers users the ability to become creators of content (Cormode & Krishnamurthy, 2008).

Defining Web 2.0

The term Web 2.0 refers to how people are using the Web differently as technology changes and people become more connected using the Internet. Crane (2012) explained how Web 2.0 could be referred to as a Read/Write Web and is especially productive for involving students in inventive achievement. This is because Web 2.0 is a two-way method, which allows users to publish their own content and respond to what others publish. A large part of that creativity comes from the ability of students collaborating on projects. Crane (2012) identified trends for Web 2.0, which include: (a) how technology is "empowering students;" (b) how Web 2.0 presents a "tidal wave of

information;" (c) that "everything is becoming participative;" (d) students using the new technology are the "new consumers;" (e) this is now the "age of the collaborator;" (f) there is an ongoing "explosion of innovation;" (g) with Web 2.0, "social learning gains headway;" (h) social networking is the common thread; (i) Web 2.0 is leading the way for a "new publishing revolution" (pp. 2-3). These are the trends that teachers need to understand as they help students shape the future of the technology using Web 2.0 tools.

Web 2.0 and Teaching

Adcock and Bolick (2011) discussed the various tools of Web 2.0, which included social media sites such as Facebook and Twitter, but also included wikis, video sharing, podcasts, and blogs. Becoming familiar with and using these tools, the authors argued, would allow preservice teachers to guide students in using technology. Preservice teachers have learned about different learning styles and how to teach to those differences. Using Web 2.0 tools has allowed all students to learn because the tools uses a variety of auditory, visual, three-dimensional, and written formats. Preservice teachers have learned pedagogical theoretical approaches such as constructivism, as well. Web 2.0 tools could bring students together collaboratively as they construct new knowledge through social networking. Students have gained much more control over the information and are no longer passively learning. They are actively teaching each other. Active participation, collaborative creativity, and socially constructing knowledge are all parts of creating critical, problem-solving thinkers (Adcock & Bolick, 2011).

Web 2.0 in Saudi Arabia

Using Web 2.0 tools is not only new to both public and private universities in Saudi Arabia, it has been seen as offering greater ability for interaction and more

inclusive user experience. Such tools could be seen as transforming not only education in Saudi Arabia, but global education (Aqil et al., 2013). The authors listed four areas of how using Web 2.0 tools effected users: inquiry, literacies, collaboration, and publication.

> ”Inquiry“ methods allow users to conduct new ways to research. . . . The ”literacies“ impact implies that through experience with the written word users can improve their communication skills. . . . ”Collaboration“ helps individuals to engage in activities as online governmental debate or participation in community forums. ”Publication“ allows users to easily create and publish material for public dissemination. (p. 159).

In these ways, anyone using a wiki could become part of an online collaborative effort, which is why this has been a valuable tool for university students.

Web 2.0 Tools

Wikis

Wikis could be used as part of required class assignments especially if the project was dependent on the group knowledge sharing (Alzahrani, 2012). The usefulness of the Wiki has been important to collaborative projects so that students could offer peer reviews directly to the work, as well as offering suggestions and editing for each other's writing. How this has been used in Saudi Arabia has been relatively unknown. Using wikis has been another form of communication available to students that might not be willing to share and work together inside the classroom due to shyness or feeling awkward. The distance provided by interacting via Wikis could help students overcome some of these feelings of shyness. Also, according to Alzahrani (2012), there have been only about 10 studies about the use of wikis in Saudi Arabia. This has indicated that more research on the effectiveness of using wikis in Saudi schools is necessary.

According to Adcock and Bolick (2011), a wiki is the kind of application to be used as an online collaborative space for students to share, edit, and add to each other's

work that could then also be published on the web. Alshumaimeri (2011) agreed about how effective wikis could be for collaboration. Wikis are usually only used to teach writing skills, however, the author suggested that teachers need to make sure that collaborative assignments need to lead to improved academic achievement. If that was not happening, then the format needs to be examined and changes need to be made so that online collaboration was a positive experience. It has also been important to realize that wikis may change in nature as technology changes, so teachers and students need to work together to use technology in ways that continue to offer educational benefits. By giving students a platform that is student-centered and self-directed, student interaction has become an environment for real time problem solving. One concern for teachers who use group projects has been when one member of a group does a majority of the work, another member does little, and the rest of the group agrees with the leader. Wikis have created more balance since each person's work would be recorded and seen by the group, as well as the teacher. Using the technology available to work together in teams creating work that demonstrates knowledge growth and academic achievement has given strength to the collaborative nature of wikis (Alshumaimeri, 2011).

The PBWorks Wiki Tool

There are many advantages to using PBWorks as a wiki tool in collaborative projects. Students are able to make many different types of documents, including text with pictures, tables and graphs, videos, files, and hyperlinks (Ibrahim, 2011; Price & Wright, 2012). Each student acts as an editor of the particular space assigned to the group, while the teacher acts as a facilitator for the assignment. The teacher is also able to set security (Ibrahim, 2011). The space could be used for the group to brainstorm how to

complete a project and separate pages could be created for each step of the project. PBWorks includes a function that tracks who participates in editing and uploading information, which allows the teacher to assess the total group achievement (Price & Wright, 2012). A real advantage to using PBWorks is how simple it is to use, including the free version (Mincic-Obradovic, 2009). For teachers and students, PBWorks is an excellent tool to begin understanding how wikis work and the power of using Web 2.0 tools in the classroom. This collaborative tool could empower students to take more control of their own learning. An opportunity for using PBWorks could be illustrated by how this tool and wikis, in general, have been used in higher education.

Wikis in Higher Education

Education trends in higher education have been leaning more towards how to establish best practices using computer technology in the classroom. Much of the technology has been more learner-centered than much of the curriculum found in traditional lecture classes. Learner-centered and interactive curriculum could be an important way for universities to attract more international students and to become more globalized (Davies, 2014). As technology has improved and more students have access to computers and the internet, the use of wikis has become more accepted as a way to support how students learn. In a study by Davies (2014), results indicated that the ways in which students constructed knowledge were better by using technology as a study strategy. The study also concluded that students' attitudes toward using technology as part of their education were also improved. Overall, students were much more likely to take more responsibility for their learning by using technology than in a traditional, lecture-only classroom. Knowing this could help instructors design coursework that

would include the use of technology, including wikis, to improve student learning. Wikis could be helpful in putting together collaborative efforts for particular lessons or for projects that could take the entire semester or school year. In this way, student achievement and student attitudes could be improved (Davies, 2014).

Collaboration

Collaboration is an essential format for bringing students together to interact without needing the constant presence of the teacher. Using collaborative efforts could help make using wikis easier and more appreciated by students (Alshumaimeri, 2011). Students could more likely remain motivated to complete collaborative tasks for a wiki assignment. In this way, the act of learning has become much more of a social interaction, which would lead to greater opportunity for peer teaching and learning (Vygotsky, 1997). Domalewska (2014) referred to collaborative learning as a the kind of activity where students are encouraged to work together creating a social activity that is completely different from solo learning using practice exercises and memorization. A wiki is a technological tool that is an efficient environment for students to work collaboratively on analyzing and solving problems, as well as to offer each other educational support.

When professionals collaborate, they tend to be from all different areas of study. Each one might have an opinion about how the project should be done. The nature of collaboration is to bring these different opinions together and incorporate them into a consistent whole. In the classroom, students often do not think they have the experience needed to share their opinions, especially if the technology involved is new to them (Price & Wright, 2012). What students who have not collaborated do not realize is that,

through collaboration, they could help each other learn important concepts. When students with differing opinions share their ideas, they could help each other construct new knowledge. All of this helps bring the community of collaborators together to create a social learning environment (Whitney & Smallbone, 2011). As the authors pointed out, this experience in the school setting has produced valuable experience of how teams in professional settings actually work together. Teachers who want to introduce collaboration using technology need to remember that there could be problems working online that students might not have in a regular face-to-face classroom. Teachers need to make sure to design projects that help students maintain respect when making comments on others' work or editing each other. The challenges could be overcome through patience and good curriculum design (Whitney & Smallbone, 2011).

Online, Hybrid, and Face-to-face Classes

Online classes are those that the student would take entirely online. The classes may be synchronous or asynchronous. Synchronous classes are when all the students appear online with the instructor at the same time, which is a set day and time. Asynchronous classes could be accessed by the student at any time and from any place. The instructor has posted all the information online and the student is responsible for maintaining a schedule to get all the work completed in the time scheduled (Al-Qahtani, & Higgins, 2013; Hilton, Graham, Rich, & Wiley, 2010; Moore et al., 2011). Online classes have grown in popularity as more and more people have access to computer technology and the internet. Online learning has been seen as an alternative to traditional face-to-face classes that offer mainly lecture (Dell, Low, & Wilker, 2010). Classes that are completely online depend on students interacting with the online information,

whereas students experience more interpersonal interaction in a traditional face-to-face classroom (Alebaikan, 2011).

Hybrid classes are a blend of online classes and face-to-face classes, although there is no one working definition of hybrid or blended classes (Caraivan, 2011). Al-Qahtani and Higgins (2013) discussed several different models of hybrid classes instead of simply offering a standard definition. According to Alebaikan (2011), combining the traditional or face-to-face class with some online component has been the most common definition. In considering how the online information should be delivered in addition to time spent in the classroom, Alebaikan (2011) discussed three distinct types of blending: enabling, which would be when the material available online was about the same as the material offered in class; enhancing, which would be when the online material was in addition to the in-class material; and transforming, which would be when some of the online material completely replaces what would otherwise be taught during lecture in the classroom. There have been studies that indicate that hybrid learning could improve individual learning (Caraivan, 2011), however, there has been limited information about blended or hybrid learning in Saudi Arabia.

Hybrid Classes in Saudi Arabia

Although research of hybrid classes, or blended learning, has been limited in Saudi Arabia, it has been encouraging that the Ministry of Saudi Higher Education created a National Plan for Information Technology, which encourages e-learning, including blended learning (Alebaikan, 2010). As Alebaikan (2010) explained:

> In 2006, the National Plan for Information Technology established a centre called the National Centre for E-learning and Distance Learning, which provides technical support, tools, and the means necessary for the development of digital educational content in Higher Education throughout the country, and is a vehicle

by which all university sectors can become standardized. Furthermore, blended learning was approved in October 2007 by King Saud University in Riyadh for the College of Applied Studies and Community Services (CASCS). (pp. 9-10)

This encouraging effort has given Saudi universities more opportunity to develop distance technology and blended learning opportunities for more students. According to Alebaikan (2010), King Fahad University of Petroleum and Minerals and King Khalid University have recently begun putting together curriculum for the addition of blended learning classes.

There have been challenges within Saudi Arabia to implementing changes based on technology. There has been a conservative section of the population that has only recently begun to accept the changes. In home internet service in rural areas has not been reliable. It has not been known to what extent the tools necessary are available in Arabic. Resistance to change in the schools may be due to teachers not having the skills or understanding necessary to build a blended learning course, as well as not wanting to take the extra time to learn the skills and then construct the course (Alebaikan, 2011).

It is important to meet these challenges and it is vital to conduct empirical research to demonstrate the effects of blended learning in Saudi schools. One such study was based on understanding the effects of e-learning, blended learning, and face-to-face learning on student achievement (Al-Qahtani & Higgins, 2013). The study used two experimental groups and one control group of students from the Umm Al-Qura University in Saudi Arabia. The blended learning class included regular in-class sessions of lecture combined with learning activities based on the class curriculum that were available online. The results of this study indicated a statistically significant difference between blended learning and the other two types of learning. In this instance, students in

the blended learning group had higher achievement levels than students in the other two groups. Although the researchers (Al-Qahtani & Higgins, 2013) suggested that reasons for this difference may have been because of the unique combination of a blended learning environment and this particular group of students, as well as the presence of an instructor to guide the learning, they suggested that further research needs to be completed to further test these effects.

Summary

As the literature suggested, using wikis such as PBWorks in classroom settings could provide a platform for improving student collaboration on projects. Without the creation of Web 2.0, wikis would not be possible. As more university courses could be offered either completely online or in a hybrid format, knowing how to use the tools available has become more important. Instructors who have experience using collaboration as a strategy for student achievement and enhanced student learning know the difference collaborative projects could make. This study was concentrating on discovering if using a wiki platform such as PBWorks as a collaborative tool in a hybrid setting would have a positive effect on student achievement. There was evidence that collaboration also would lead to higher levels of student satisfaction, which this study would also measure. The lack of research in Saudi Arabian university settings has indicated the need for this and other similar studies, especially as universities encourage more online learning.

CHAPTER III

METHODOLOGY

Theory

Quantitative research makes major assumptions about reality that depend on ontology, which is the nature of reality, and epistemology, which is the nature of knowledge. Researchers using quantitative methods usually use the positivist methodological approach or positivism (Tuli, 2011). Epistemology guides the researcher to question how we know what is known; what knowledge is; and how the knower, or the researcher, is connected to what is known. Positivism uses empirical investigation to measure what is known, to observe individual behaviors as a way of discovering not only patterns of behavior, but cause and effect. To do this, positivist researchers must use objective tools of measurement such as standardized tests and questionnaires. These measures have been used to explain how variables interact to cause outcomes. Positivism relies on validity, reliability, and generalizability (Tuli, 2011). The result of this inquiry is an objective measure of reality to explain human behavior. Ontology guides how the research is connected with the nature of reality. Positivists view reality as being "out there," in other words, reality exists; it does not need to be interpreted. The positivist researcher is involved with measuring the real world using scientific or empirical methods. For the purposes of this study, it was assumed that students work on collaborative group projects and the method they use would affect the outcomes.

Method

This quantitative study was designed to examine how students at Najran University, in Najran, Saudi Arabia, experience collaboration in different classroom environments. This study examined if students who use PBWorks in a hybrid class for the same collaborative activities demonstrated higher academic achievement than in the face-to-face classroom. The study also examined any changes in students' attitudes toward participating in collaborative learning experiences. The study attempted to answer the following research questions:

Q1   Will students experience statistically significant differences in academic achievement after participating in collaborative activities in a hybrid class compared with students participating in collaborative activities in a traditional face-to-face classroom?

Q2   Will students experience statistically significant differences in attitudes toward collaborative learning after participating in collaborative activities in a hybrid class compared with students participating in collaborative activities in a traditional face-to-face classroom?

Study Design

This quantitative study was designed as an experiment to understand the effects of students using PBWorks in a hybrid setting. For this experiment, the control group of students used collaborative strategies within a traditional face-to-face classroom, while the experimental group used collaborative strategies using the PBWorks wiki tool in a hybrid class setting. The design included the use of pre-test/post-test to establish student achievement within the class and the use of a pre- and post-surveys to examine student attitudes toward using PBWorks as a collaboration strategy within a hybrid setting. Using this pre- and post-test method offered some control over extraneous variables. This was important since the selection of participants was not truly random.

Institutional Review Board

Before moving forward with the selection of participants, the researcher completed the Institutional Review Board (IRB) process (see Appendix A). This process is necessary for all institutional research involving human subjects. Fulfilling the IRB requirements maintained integrity with the researcher and the university. The narrative allowed the Board to review the purpose of the study and the methodology that was used. The consent form for human subjects assured the participants of the voluntary nature of their participation and of the possibility of any risks and/or benefits. For this study, the risks to participants were minimal.

Participants and Setting

Participants for this study were current students in two identical courses at Najran University. There were a total of 40 ($N = 21$ and $N = 19$) students chosen from two classes that were in session at the time of the study. The participants ranged in age from 18 to 25 and were all male. Although the study used the course curriculum, all participation in the study survey was voluntary and not participating in the study did not affect any participant's grade in the course. Convenience sampling was used because the researcher needed to have two nearly identical classes studying the same course material taught by the same professor at the same time. The participants were in either the control group or the experimental group depending on which class was chosen to have a collaborative only assignment in a traditional face-to-face setting (the control group) and which class was chosen for the hybrid class that used the PBWorks wiki (the experimental group). The students were all in one of two Integrating Technology in Education courses taught by the same professor.

The setting was two classrooms at the University of Najran, which had an enrollment of 11, 917 students with 466 total staff (KSA, 2015). The professor teaching the course randomly chose which classroom would be used as the control group and which would be the experimental group. At the time of the data collection for this study, the city of Najran and the surrounding area experienced bombing nearly every day. The university was not in the path of the bombs and classes were conducted on a regular schedule. All of the students and the instructor involved in the study were able to attend class sessions throughout the study.

<div align="center">**Learner's Handout**</div>

To assist the participants in the hybrid class, the researcher provided a learner's handout that discussed how to use PBWorks. This was made available at the beginning of the semester in which the study was conducted. Included in the handout were instructions for the basic operation of PBWorks (setting up login information; details on security; managing wiki workspaces, pages, and files; and creating and uploading new files). The handout was to help the students become familiar with PBWorks and to have a visual aid they could refer to from time to time for assistance. Although the screenshots were in English, PBWorks now supports Arabic in its workspaces. The information on each screenshot was accompanied with an Arabic translation (see Appendix B.) Students needed to learn how to use a wiki because they had never used this kind of online tool before. The instructions included how students could each add their work for the group project and how the wiki could track who was submitting, adding, or editing the work. Students were taught how they had the ability to edit the

group work before it was submitted. During this instruction, they were introduced to the idea of working collaboratively for the first time.

<div align="center">**Instruments**</div>

The method of inquiry for this study was positivism, which used empirical research to discover how the world actually operates. Two instruments were used in this study. The first instrument consisted of two academic tests of the course material designed by the course instructor. Since the academic tests were administered by the course instructor for previous courses, the process was used with assurance for this study. The second instrument was a 25-question survey of student attitudes toward collaborative learning (see Appendix C). How both of these instruments were administered to each group is explained in the procedures. Both groups were given identical instruments.

The questionnaire for this study was adapted from a study of collaborative learning in an asynchronous collaborative learning (Dewiyanti et al., 2007; Ibrahim, 2011). The results of testing the questionnaire showed high reliability and validity. For this study, a copy of the questionnaire translated into Arabic was administered to the participants. A 5-point Likert scale was used for responses: *strongly agree, agree, neither agree nor disagree, disagree,* and *strongly disagree.*

The 25 questions on the questionnaire were designed to measure students' experiences with collaborative learning and were broken into 6 variables. Table 1 explains the six variables, how many questionnaire items were used for each variable, and the Cronbach's alpha for each measure (Dewiyanti et al., 2007)

Table 1

Students' Experiences with Collaborative Learning

Variable	*N*	α
Monitoring working procedures	8	0.87
Participation	5	0.85
Monitoring group progress	5	0.83
Helping each other	3	0.70
Giving feedback	2	0.75
Need to be monitored	2	0.68

Procedure

Participants were members of one of two classes being taught by the same instructor using the same course material. One class was the control group, which was a face-to-face class and did not use the PBWorks wiki to do the collaborative assignment as part of this research. The experimental class was a hybrid class doing some of their course work online, including the collaborative assignment using the PBWorks wiki as part of this research. Both groups received the same type and amount of course information.

At the beginning of the semester, the instructor explained that part of the course would include a collaborative, small-group assignment. The course would otherwise be taught in the same format the instructor had previously used. In both classes, students took a test following the first segment of lessons, which took place in the third week of the semester. The results of this first test were used as a baseline for academic achievement.

At that point in the course, the instructor introduced the collaborative assignment to both classes. For the assignment, each class was broken into small groups of four or five students. The instructor provided written instructions for the collaborative assignment. It is worth noting that none of the students in either class had worked together in collaborative groups. This idea was new to them. Both the researcher and the instructor spent time explaining how collaboration works. Students in each class were put together in small groups of four or five so that there were four small groups in each classroom. The students were told that they would work in their groups on a single project for 3 weeks. Each member in each group was responsible for completing specific parts of the assignment. The assignment was to write a paper covering the subject they were studying at the time and every group was given the same assignment. Group 1 was comprised of five small working groups and Group 2 was comprised of four small working groups.

The control group class (Group 1) did the collaborative work only while in the classroom. Individual students were allowed to work on their own outside of the classroom and bring material to class to share with their groups, but the group work took place only during classroom time. The experimental group class (Group 2) did the collaborative work using only a PBWorks platform and worked on the assignment at any time. The instructor allowed students in Group 2 to work together in groups in the computer lab for a minimum of one class period per week. Students in Group 2 were allowed to work in the computer lab at their convenience outside of class. They could also work on personal computers at home if possible. The assignment took both classes approximately four weeks to complete. The researcher worked with the instructor to

make sure the students in Group 2 knew how to use the PBWorks wiki. The instructor and the researcher set up a secure PBWorks account for Group 2 to use.

At the beginning of the experiment, all of the students in both classes were given the 25-question survey asking their perceptions of collaborative work. The questions on the survey were designed to weigh students' perceptions of six variables. The results of this first survey were then compared with the results of the same survey that was given to the students at the end of the assignment to measure if students' attitudes toward collaboration changed. Then the results of the survey of Group 1 were compared with the results of the survey of Group 2 to measure if there was a difference in students' attitudes between the two classes.

Following the completion of the collaborative assignment, the instructor gave an academic exam based on the learning goals of the assignment. The results of this test were compared with the results of the first exam to measure if using collaboration as a strategy changed academic achievement. Then, the results of the second exam from Group 1 were compared with the results of the same exam from Group 2 in order to measure if using PBWorks changed academic achievement more than using only in-class collaboration.

The instructor of the course administered the academic tests. Before the students took the survey, the instructor explained that taking part in the survey did not affect students' grades in any way. The instructor also explained that students must not put their names on the forms and that their names would never be used in any of the information collected. A research assistant handed out and collected the surveys from students during the class period. The envelopes used to collect the surveys were marked as "Group 1" and

"Group 2." The assistant did not show the surveys to the instructor at any time but delivered them to the researcher.

The instructor allowed the participants to know that their grades were not dependent on their participation in the research. If at any time the instructor determined that the study was detrimental to the participants or was interfering with their progress in the course, the instructor could have stopped the study.

No identifying information was attached to any of the documents or transcripts. All survey result information was maintained in a password protected, encrypted computer file available to the researcher. No identifying information was made available to the researcher at any time. When the pre- and post-test of the questionnaires were administered, the instructor explained the procedure to the students. Then, an assistant handed out the questionnaires. When students finished, the questionnaires were collected and put into an envelope that was sealed and then delivered to the researcher. The researcher randomly assigned alpha/numerical identifications for each questionnaire.

Data Analysis

Data analysis for this study was completed using SPSS 20.0 software. There was one dependent variable (test scores) in the first research question and one independent variable with two levels, an experimental group and a control group. There were six dependent variables for the second research question: (a) how working procedures are monitored, (b) levels of participation, (c) willingness to help each other, (d) how group progress is monitored, (e) feedback, and (f) the perceived need for monitoring. As with the first research question, there was one independent variable with two levels, an

experimental group and a control group. The alpha level for this study was set at 0.05. A two-way ANOVA was used on the data for both research questions.

Summary

This quantitative study design was used to measure if there were any statistically significant differences in academic achievement or attitudes toward collaboration between two groups of students (one group in a traditional face-to-face classroom and another group in a hybrid class). The data collected from pre-post academic tests and pre-post surveys were analyzed using a two-way ANOVA. The results of that data analysis are presented in Chapter IV and discussed in detail in Chapter V.

CHAPTER IV

RESULTS

The following are the results of the data/statistical analyses that were performed to answer the research questions regarding students' collaborative experiences, academically and attitudinally, in either a traditional (face-to-face) or hybrid (face-to-face and online) undergraduate course, Integrating Technology in Education, at Najran University in Saudi Arabia. Academic performance was defined by pre- and post-tests that were assessed by the same instructor for both groups. Attitude toward collaboration was defined in this dissertation, according to a survey that was developed by Dewiyanti et al. in 2007, and translated into Arabic for a similar subset of students in Kuwait (Ibrahim, 2011). This chapter provides the appropriate data analyses to answer the two research questions set in Chapter I, substantiated in Chapter II, and made clear in Chapter III.

Method of Analysis

The first consideration was running a repeated measures MANOVA because two dependent variables were involved (achievement and attitude) over a period of time (pre- and post-surveys). One of the assumptions of this type of MANOVA, however, was that the dependent variables must be correlated. The data indicated that the dependent variables were not correlated. At that point, a two-way mixed ANOVA was run using SPSS 20.0.

Assumptions

The purpose of conducting a two-way mixed ANOVA was to compare the mean differences between groups, especially when determining if there were differences between independent groups over time. It was also important to discover if there was any interaction between variables on the dependent variable. This two-way mixed ANOVA had one between-subjects factor and one within-subjects factor for each research question.

Of the assumptions for the ANOVA, the first assumption stated that one dependent variable was measured at a continuous level, for example, academic achievement or attitude. The second assumption that there was one between-subjects factor, or independent variable, that was categorical with two or more categories. The categorical variable was measured on a Likert scale. The 25 survey questions concerning attitude were broken into 6 categories: (a) Monitoring working procedures, (b) participation, (c) monitoring group progress, (d) helping each other, (e) giving feedback, and (f) need to be monitored (see Table 1). The participants in Group 1 and Group 2 were considered unrelated.

The within-subjects factor that was categorical were related because the participants were measured on the same dependent variables at the same time points and under the same conditions, in this case class_id and time. The results indicated that there were no significant outliers in any cell of the design. Wilks' Lambda revealed no significant differences in attitude between Group 1 and Group 2 toward working in collaborative groups, $F(1,1) = 61.206$, $p = .0005$; $\eta^2 = .617$, with only 38% of variance

unexplained in the dependent variable, which showed that there was a significant effect of time on the dependent variable.

Lavene's test for equality of variances tested the variance of the dependent variable to make sure it was equal between the groups. Although the pre-test attitude showed variability ($F = 7.47$), it was almost the same for the post-test in attitude ($F=.698$). To show that the covariances were consistent, Box's test of equality of covariance matrices was used. The results ($M = 17.45$; $F = 5.485$, $p = \leq .0001$) indicated that the two covariance matrices were equal. Mauchly's test of sphericity showed that the variance of differences between groups was equal and that the assumption has not been violated, $x^2(2) = 0$, $p = 1.00$. All of the essential assumptions of the ANOVA were met. The following results were obtained as they relate to each of the research questions.

Research Question Q1

Q1   Will students experience statistically significant differences in academic achievement after participating in collaborative activities in a hybrid class compared with students participating in collaborative activities in a traditional face-to-face classroom?

The answer to Research Question Q1 was, yes in a certain way. Figure 1 displays the data generated by SPSS in a 2 x 2 factorial mixed design in response to this question. Overall, students in both classes demonstrated academic achievement, as they collaborated in their group projects. While the two groups were not significantly different at either the beginning or the end, there was a statistically significant difference in the rate of progress in achievement.

Table 2 presents the descriptive statistics regarding the pre- and post-test results for both groups' achievement scores. There were minimal differences between the test scores of the two groups; but the increase in the mean between the pre-test and the post-

test for Group 2 showed a greater increase than for Group 1. The hybrid group went from

a lower score to a higher score at a faster rate than the traditional group of undergraduate

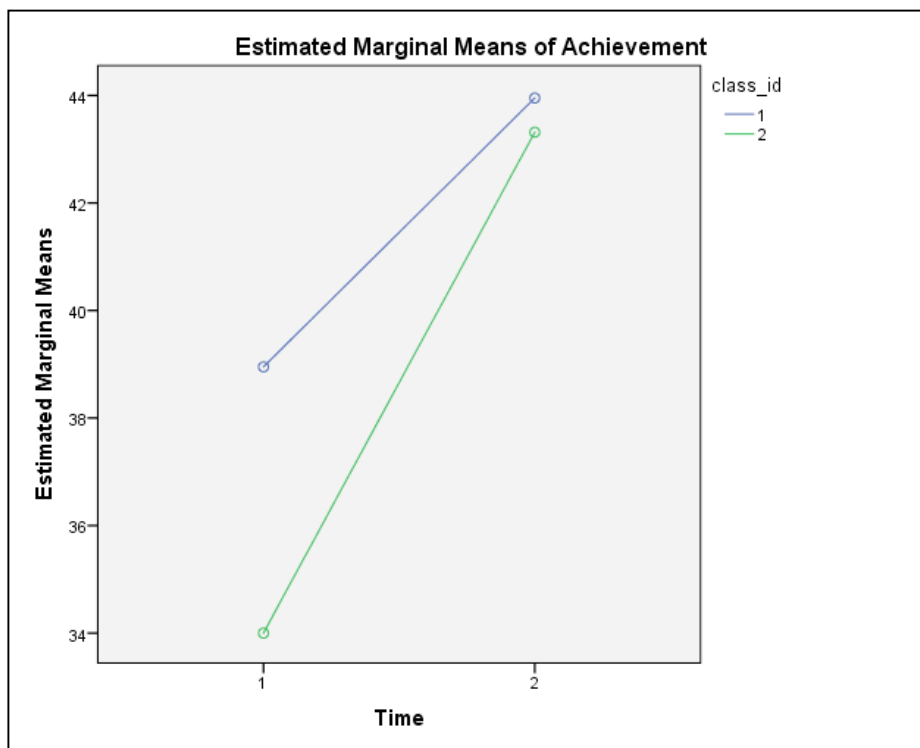students. This rate is demonstrated in Figure 1.

Figure 1. Achievement between traditional and hybrid pre- and post-tests

Table 2

Descriptive Statistics--Mean Between Groups' Achievement

Achievement	class_id (Groups)	M	SD	N
Pre-test	1	77.90	13.849	21
	2	68.00	18.714	19
Post-test	1	87.90	7.886	21
	2	86.63	5.659	19

The final comparative outcome showed that the two groups realized similar academic achievement. Yet, despite starting at a slightly lower but not statistically significant academic achievement level, students from the hybrid group finished the course at a nearly equivalent level. Ultimately, the analysis showed a statistically significant interaction between the intervention (traditional vs. hybrid collaboration) and time on the projects.

Research Question Q2

Q2   Will students experience statistically significant differences in attitudes toward collaborative learning after participating in collaborative activities in a hybrid class compared with students participating in collaborative activities in a traditional face-to-face classroom?

The answer to Research Question Q2 was, no. The determination of significant difference between Groups 1 and 2 in terms of collaborative attitude was based on pre- and post-survey results that were collected before and after the intervention of implementing a collaborative project in each group.

Table 3 presents the descriptive statistics regarding the pre- and post-test results for both groups, separately. There were minimal differences between the scores of the two groups, based on a Likert scale for both for pre- and post-tests; but, there was an increase in mean for between the groups' post-test results.

Table 3

Descriptive Statistics--Mean Between Groups' Attitude Toward Collaboration

Attitude	class_id (Groups)	*M*	*SD*	*N*
Pre-test	1	3.3314	.34966	21
	2	3.5095	.80464	19
	Total	3.4160	.60797	40
Post-test	1	4.2133	.56219	21
	2	4.3263	.39130	19
	Total	4.2670	.48581	40

The traditional and hybrid classes (class_id) revealed no significant difference regarding the average attitude of the students in either class. There was a marginal difference between students' attitudes. Those in the hybrid class ranked a higher means in terms of positivity toward collaboration in the group project.

The following diagram (see Figure 2) clearly demonstrates students' attitude that there was no significant difference between the traditional and hybrid groups at the beginning, as well as at the end of the courses. Furthermore, the rate of growth for both groups was similar. Therefore, there was no statistical difference between groups in pre, post, or interaction (time and attitude).
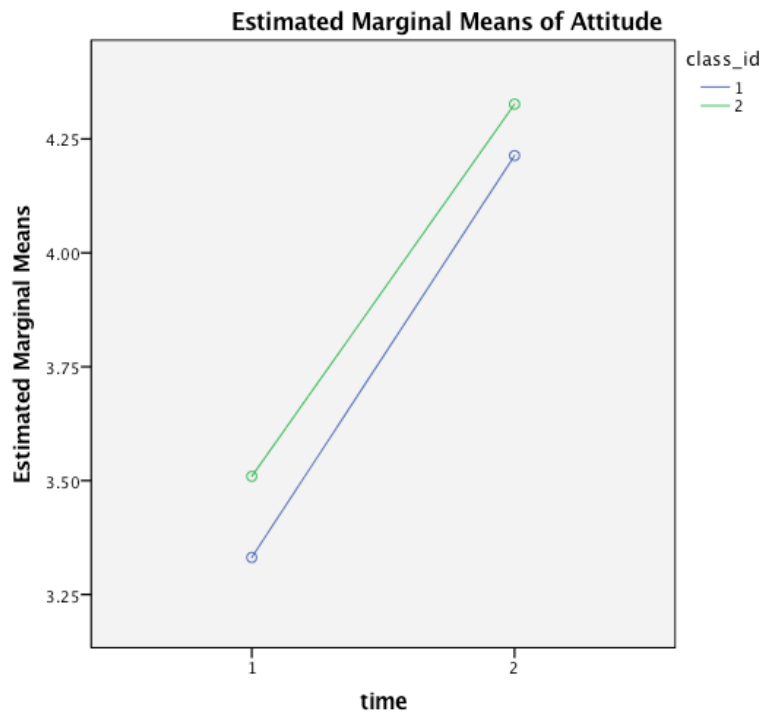
Estimated Marginal Means of Attitude

Figure 2. Estimated marginal means of attitude

Summary

This chapter provided the results of the statistical analyses that were generated by SPSS for descriptive data and the 2 x 2 mixed factorial tests in order to answer the two guiding research questions. Also presented in this chapter were the results of the levels of significance for the 0.05 alpha level. It was shown that there were no significant differences among students regarding academic achievement over time, although there was a statistically significant difference in the rate of progress in achievement because Group 2 improved at a faster rate. Also there were no significant differences regarding students' attitudes from the beginning and conclusion of the two courses. These findings are discussed in Chapter V.

CHAPTER V

DISCUSSION

The purpose of this study was to examine how students at Najran University, in Najran, Saudi Arabia, experienced collaboration in different classroom environments. This study examined if students who used PBWorks in a hybrid class for the same collaborative activities demonstrated higher academic achievement than in the face-to-face classroom. The study also examined if there were changes in students' attitudes toward participating in collaborative learning experiences. All the students were in one of two Integrating Technology in Education courses taught by the same professor. A comparison was made between students in the traditional (face-to-face) class and students in the hybrid (both online and face-to-face) class. This chapter discusses the findings based on the two research questions. The discussion includes the limitations and implications of the study as well as a discussion of recommendations for future research and educational applications in e-learning.

Discussion of the Study Results

The results of the data analysis for each of the research questions are discussed here.

Research Question 1

The first research question concerned students' academic achievement. The classes were Group 1 (the control-traditional group) and Group 2 (the experimental-hybrid group). Each group was given a pre-test before being introduced to collaborative

learning and a post-test at the end of the experiment. The statistical analysis between groups indicated that students in both classes demonstrated academic achievement after collaborating in group projects. Both groups showed no statistically significant difference at either the beginning or the end of the experiment. However, there was a statistically significant difference in the rate of progress in achievement. The hybrid group went from a lower score to a higher score at a faster rate than the traditional group.

Both groups had nearly identical academic achievement levels before the collaborative group work was introduced, although the hybrid group was slightly, but not statistically significantly, lower than the traditional group. Following the project, the hybrid group finished the course at nearly the same level as the traditional group. Since the analysis showed a statistically significant interaction between the intervention and time, this indicated that using PBWorks helped students achieve academically at a faster rate than not using an online collaborative tool.

There are possible reasons that the hybrid group was able to achieve at a faster rate based on their use of PBWorks. Using a wiki both in and out of the classroom allowed students to communicate with each other at any time, whereas students working in groups in traditional classrooms were generally limited to conversations that only took place in the classroom. Students working online also had more access to online resource materials that they could access at any time and from any place. This gave students in a hybrid setting an advantage of doing work when and where they choose instead of waiting to meet in the classroom (Globokar, 2010).

Another advantage was how students from one group could write on another student's group page because they shared a common workspace and discussion board.

The students in the traditional class did not have access to other group's ideas and discussions. Discussions between students have been shown to help students understand material presented in the classroom (Kear, Donelan, & Williams, 2014). As a final advantage, PBWorks and other online wiki tools offered online access to additional resources such as links to videos, images or pictures, and other documents that students sitting in a traditional classroom did not have.

Research Question 2

The second research question concerned students' attitudes toward working in collaborative groups. Analysis of responses to a 25-question pr2- and post-survey were completed to determine any statistically significant difference in attitudes between the traditional group and the hybrid group before and after they had completed working in collaborative groups.

When the data were analyzed between subjects, it was found that attitudes changed linearly over time, indicating cause and effect between the introduction of collaborative projects and a change in attitude. However, since there was no linear change for the term of the experiment, attitude remained independent whether the students were in the control or the experimental group. The average measure of attitude was not significantly different between groups or between the average attitudes of the students in either class. It was the estimates of time that were different.

The data analysis clearly showed that there was a change in attitude over time. However, since there was no significant difference between groups at either the beginning or the end of the course and the rate of growth for both groups was similar,

there was no statistically significant difference between groups in pre- and post-survey or interaction between time and attitude.

Prior to this study, none of the students in either group had participated in group collaboration. They had not realized how much they could learn from each other by working in groups. As Whitney and Smallbone (2011) pointed out, students working in collaborative groups were actually creating a new learning environment that encouraged the construction of new information. In this study, students in both classes found the experience favorable. The study that the authors conducted was done to assess how well wikis could be used for student collaboration assignments and to make recommendations based on the findings. Using technology to improve how students build knowledge in social groups was related to social constructivism pedagogy. Peer group interaction and collaboration is a learner-centered approach rather than a teacher-centered approach of traditional face-to face, lecture-based classes.

Collaborative learning should not be confused with cooperation. Cooperation on an assignment is often when each student is responsible for only one section of an assignment and students do not work together to solve the problems presented not only by the assignment, but also by the nature of working together (Whitney & Smallbone, 2011). This is the social interaction that Vygotsky said leads to the construction of new knowledge. Using technology to improve collaborative skills is beneficial for students and can be translated into real world applications in businesses and professional organizations. Using technology to work collaboratively helps students create their own working space. Elgort, Smith and Toland (2008) discussed many elements necessary for collaborative learning to be successful. This included how collaboration encouraged

"positive interdependence" (p. 197) that could be particularly useful for students who were unable to meet face-to-face. This interdependence was a new idea for the two groups in this study at the University of Najran.

As Kear et al. (2014) suggested, using a wiki in an online forum could be especially beneficial. When students realized that they were creating their own working environment that they could all see, they tended to become more engaged in the process with less need for monitoring by the instructor. This could "support a learner-centered pedagogy and foster self-regulated learning" (Dabbagh & Kitsantas, 2012, p. 1). The authors defined self-regulated learning "as a student's ability to independently and proactively engage in self-motivating and behavioral processes that increase goal attainment" (p. 3). This would indicate that students become responsible for their own learning processes because of their own interest in learning new information.

The Dabbagh and Kitsantas (2012) study was about the pedagogy of designing personal learning environments (PLEs) that used the technology of social media as a way to bring together the formal and informal education opportunities that support self-regulated learning for students in higher education. Their study examined how the Internet could be used as the tool for "communication, collaboration, and creative expression" (p. 1), which included using wikis such as PBWorks. Within the review of empirical investigation, Dabbagh and Kitsantas (2012) noticed that collaboration was one of the most frequent uses of technology by college students. The technology was also increasingly being used by college and university faculty to encourage learning activities that rely on collaboration. The authors suggested that this way of using technology has led to "the emergence of constructs such as pedagogy 2.0" (p. 2).

Using technology for collaboration has been a pedagogical shift that has suggested being a member of a collaborative group was at the core of learning instead of a simply way of learning. By building social media that supports PLEs into the basic curriculum, college instructors have been creating a new pedagogical support for student learning that was personal and relevant. The pedagogical theory that explains this shift has looked at how the technology supports the growth from building a personal space (PLE) where the student in charge of individual knowledge was managed and how more knowledge was gained. The next step was how the student was able to become part of the group collaboration through social media. The shift from self-regulated learning to group learning was made by the student, supported by the instructor, and led to socially mediated learning that Vygotsky (1997) explored.

Learning at the level of using wikis for collaborative assignments is fairly low level. Wikis could help students create their own spaces that could be shared with other students. At this level, students are learning about sharing personal space, measuring their own productivity with others, and how to organize using the technology available. As students become comfortable with this level of technology, they could gain more control over their ability to create and construct knowledge in both formal and informal settings. An important comment made by Dabbagh and Kitsantas (2012) has fit well when considering the challenges students in Najran faced because of the war there: "The motivational components of self-regulated learning help students persist in the face of difficult tasks" (p. 4). University students in Najran have continued to persist.

An important factor the data did not particularly measure was the effect of war on students' ability to regularly attend classes and how using technology could offer an

effective alternative to attending the traditional, face-to-face class. Carpenter (2005) related how Saudi Arabia closed schools for weeks during 2004 in response to threats of terrorist activities. When schools were closed in emergency or ongoing situations, such as the current war with Yemen, being able to access information from a distance could take on a level of importance that could be beneficial for students who were sheltering away from the effects of the situation. This could be seen today in Najran, where military actions have continued to threaten schools every day. During the gathering of the data for this study, classes were being held at the University with the understanding that bombing could have happened at any time. The researcher had given the students in the experimental group his email and text information so they could ask technical questions at any time. One student emailed a question that reflected the reality of war in Najran. The student asked how he was able to access the assignment if his laptop were to get bombed. The researcher explained that as long as the student could get Internet access, he could access the assignment using his log-in name and password. Giving the student assurance that he would be able to continue the assignment as long as he could access the Internet allowed the student to feel less stressed by the situation he was facing. This is only one of the advantages of using technology in education. As long as students could access the Internet, they could continue with their learning activities. On the other hand, the fear of losing a personal computing device because of war has been a real fear that so many students around the world face every day.

Limitations

There are always limitations to quantitative studies including generalizability sample issues, including generalizability. This study was no different in that there were

limitations beyond the control of the researcher. The first limitation concerned the selection of the sample. The researcher used convenience/criteria sampling rather than truly random sampling. It was true that the researcher did not know what course and professor would be chosen by the authorities at the University, but the sample did need to meet specific criteria, including that the two classes needed to be similar in size, be the same subject (course level and material), and be taught by the same professor. The class chosen to be the control group was a random selection made by the professor. A second sample issue concerned sample size. The control group was larger ($N = 21$) than the experimental group ($N = 19$) meaning that the total population was only 40 students. Gender was another issue in that all the students were male. It would be difficult to generalize the results to larger populations based on small sample size and limited gender.

Two limitations completely outside the control of the researcher included the limited knowledge of the professor and the students in using technology. Much of the study showed some resistance to using the new technology now available at the University. A second limitation for this particular study was that students had a difficult time connecting to the Internet using Wi-Fi. This was due to the effects of the current military conflict, which limited the strength and availability of Wi-Fi connectivity.

Implications

Building technology-based social construction of knowledge into the curriculum can help students transfer their education to real life career goals. Instructors and institutions can work at developing and supporting the curriculum necessary to deliver using technology in this context. Using wikis as part of an educational experience can be

a beneficial part of developing employer desired skills (Whitney & Smallbone, 2011).

Using technology as part of the educational experience has other implications as well.

The Hong Kong International School (HKIS) experienced an emergency situation in 2003 that required educators to create an online education program. There was an outbreak of Severe Upper Respiratory Syndrome (SARS) that closed many schools (Carpenter, 2005). As part of that situation, HKIS put together a three-phase plan for using technology in emergency situations. What leaders at HKIS learned from this exercise was that it was vital to make getting assignments easy for students and their parents, especially for those with limited technology skills. They also realized that the "virtual school was as much about providing emotional and social support as meeting educational needs" (p. 10). When students are physically isolated due to crisis situations such as this SARS outbreak or any other emergency, such as war, it is important to be able to offer a sense of normalcy.

Carpenter (2005) found that students were motivated to keep up with their assignments even though they were under stress from the situation. There was a sense of community in working together online. The teachers involved found out how challenging it was to change quickly to an online presence. Once they had accomplished that move and school went back to its regular schedule, the next two phases were to continue building on the success of this form of distance learning and create a standardized platform that could be used by others. The format HKIS decided on using was strongly grounded "in social constructionist pedagogy" (p. 13). As Carpenter (2005) stated, it did not matter if it is "an outbreak of disease, a natural disaster, or political and social unrest,

a crisis must not stop schools from meeting the learning and social needs of their students" (p. 14).

In Saudi Arabia, most university instructors and professors have continued to use face-to-face lectures in traditional classrooms to deliver instruction. According to Alamri (2011), there should be a shift from this teacher-centered pedagogy to a student-centered pedagogy. This is important in order to allow students to become more responsible for their own learning and to help students have more flexibility. Social interaction using technology could help facilitate this process. As Alamri (2011) stated, "it is important to use different teaching strategies that motive students and ensure achievement of the objectives" (p. 90). Institutions of higher education in Saudi Arabia that have built in technology could also guide instructors on how to build learner-centered pedagogy into the curriculum.

This study demonstrated that using online resources, such as PBWorks, could make a difference in how quickly students achieved academically. This could have an impact on schools that were building a greater online presence or on course material taught in a hybrid environment. Professors considering the design of their courses might come to realize that allowing students to learn from each other and to access more information online could save valuable classroom time. Students could become better at self-regulated learning by becoming more familiar with using online resources. They may learn the importance of learning from fellow students as well as learning from the professor and the textbook. Since education technology has continued to advance, it would be important for educators to learn the value of incorporating the technology into

the curriculum. Using the Internet for distance learning could impact how education would be able to continue in war-torn areas.

Recommendations for Future Research

Although it is important for educators to learn more about how technology could be used, more research into what types of technology works best is needed. This study was a replication of another study done in Kuwait (Ibrahim, 2011). In both studies, the sample sizes were small and limited by gender. Other researchers could follow the procedures found in this study to discover if the results would hold up in other circumstances. Only when enough studies have been done on the use of wikis for group collaboration could there be enough verification to support using wikis as an evidence-based best practice. Students in this study spent a short time in the experiment. A study that follows students for up to a year might produce different results.

The Kuwaiti study (Ibrahim, 2011) was conducted with only female students and this current study was conducted with only male students. Research of co-ed classes might be another important area for research to discover if there was a difference in results based on gender. Other different forms of this study might include online only courses rather than hybrid courses and testing high school or graduate students. It would be interesting to discover teacher attitudes as well as student attitudes, which could be an addition to the research.

Colleges and universities looking for best practices in online environments should consider using technology after it has been tested to find how well it works. Research needs to continue into those areas that are the most effective for student learning.

Academic achievement is not the only determination of student success. It is important to continue to discover how students feel about using the technology.

Conclusion

The researcher for this study was concerned with two major questions. The first question was to determine if any differences existed on the effect on academic achievement between two different class environments: a traditional, face-to-face classroom and a hybrid class using the wiki tool PBWorks. The second question was to investigate if there was any effect on students' attitudes toward collaborative learning based on these two class environments.

The results of the study indicated that there was a significant difference in academic achievement based on the variable of time. Both groups showed about the same levels of academic achievement, but the hybrid group that used PBWorks improved at a faster rate than the face-to-face group. Students' attitudes toward learning in collaborative groups showed no statistically significant differences between the groups either before or after the experiment. However, the results indicated that the improvement in attitudes in both groups was related to the introduction of working in collaborative groups, regardless of the environment.

Using PBWorks had a positive effect on academic achievement and working in collaborative groups had a positive effect on students' attitudes toward working collaboratively. It is possible that using any wiki platform in a hybrid setting might have positive effects on academic achievement. The finding that working collaboratively was met with positive attitude was encouraging. Students learning from each other could only reinforce what instructors were working at teaching every day. Finding ways to help

students use technology and to learn in any environment at any time is an important

aspect of the future of education technology. With the concerns of trying to continue

education efforts in war zones, in places where students are unable to travel to schools,

and in situations where students might not be able to afford attending school, finding best

practices in the use of education technology is vital.

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APPENDIX A

INSTITUTIONAL REVIEW BOARD FORMS

Narrative: UNC IRB Application

Researcher: Hadi Almonuf

Title: Student Collaboration in Hybrid Classrooms Using PBWorks: A Study of
University Students in Najran, Saudi Arabia

A.   Purpose

The purpose of this study is to examine how students at Najran University, in Najran,
Saudi Arabia, experience collaboration in different classroom environments. Students
taking part in collaborative activities in face-to-face classes often show higher levels of
academic achievement (Al-Fahad, 2010). This study will examine if students who use
PBWorks in a hybrid class for the same collaborative activities will demonstrate even
higher academic achievement than in the face-to-face classroom.

The study also examines any changes in students' attitudes toward participating in
collaborative learning experiences. If students have a positive attitude toward
collaborative learning in a face-to-face classroom environment, it is hypothesized that
students' attitudes toward using PBWorks in a hybrid class for the same collaborative
activities will be more positive than those of the students in the face-to-face
classroom.This exploratory study qualifies as exempt inasmuch as the research involves
the use of an electronic survey that will not disrupt or manipulate the normal life
experiences of adult participants, will not use any form of intrusive procedures, and will
use pseudonyms to protect the identity of all adult participants.

This study will be conducted to fulfill requirements for a Ph.D., Education
Technology**,** supervised by Dr. Anna Ursyn. Contact information: phone number:
970-576-0180, email: ursyn@unco.edu

B.   Methods--Be specific when addressing the following items.

1.   Participants

All participants will be students at the University of Najran, Najran, Saudi
Arabia. Participants for this study will be current students in two identical
courses at Najran University. There will be 20 to 40 students chosen
depending on the class sizes at the time of the study. The participants will
range in age from 18 to 25 and will all be male. Although the study will
use the course curriculum, all participation in the study survey is voluntary
and not participating in the study will not affect any participant's grade in
the course.

All participants will be over the age of 18 and none will come from a
vulnerable population. Participants will be told that their participation is
completely voluntary and that they may choose to end their participation
in the survey at any time.

2. **Data Collection Procedures**

   a. Participants will be members of one of two classes being taught by the same instructor using the same course material. One class will be the control group, which will be a face-to-face class and will not use the PBWorks wiki to do the collaborative assignment as part of this research. The experimental class will be a hybrid class doing some of their course work online, including the collaborative assignment using the PBWorks wiki as part of this research. Both groups will receive the same type and amount of course information.

   b. I will work with the instructor to make sure the students in the experimental group know how to use the PBWorks wiki. The instructor will set up a secure PBWorks account for the experimental group to use.

   c. The instructor of the course will administer both the pre- and posttest items. There will be pre- and posttest for academic achievement and the survey to compare the effect of the treatment.

   d. Participants will take a test based on course content before the treatment and following the treatment. Their final grades will not be impacted by the results of either test. The instructor will let the participants know that their grades will not be dependent on their participation in this research.

   e. The survey has 25 questions designed to determine changes in attitude toward using a wiki to do collaborative work. The survey is based on one used in previous studies that has been validated.

   f. No identifying information will be attached to any of the documents or transcripts. All survey result information will be maintained in a password protected, encrypted computer file available to the researcher. No identifying information will be available to the researcher at any time.

3. **Data Analysis Procedures**

   Data analysis for this study will be completed using SPSS 17.0 software. There is one dependent variable (test scores) in the first research question and one independent variable with two levels, an experimental group and a control group. There are six dependent variables for the second research question: 1) how working procedures are monitored; 2) levels of participation; 3) willingness to help each other; 4) how group progress is monitored; 5) feedback; and 6) the perceived need for monitoring. As with the first research question, there is one independent variable with two levels, an experimental group and a control group. The alpha level for this study will be set at 0.05.

Q1   To what degree will students experience greater academic achievement after participating in collaborative activities in a hybrid class compared with students participating in collaborative activities in a traditional face-to-face classroom?

Q2   To what degree will students experience improved attitudes toward collaborative learning after participating in collaborative activities in a hybrid class compared with students participating in collaborative activities in a traditional face-to-face classroom?

4.   Data Handling Procedures

No identifying information will be collected from any of the participants by the survey. The researcher will not have access to any identifying information. All of the information collected will be maintained in an encrypted file on the researcher's personal computer. Data will be stored for a period of three years following collection.

C.   Risks, Discomforts and Benefits

The risks inherent in this study are no greater than those normally encountered during regular classroom participation. In addition, all participation is voluntary, and participants may stop answering questions at any point.

D.   Costs and Compensations

None.

E.   Grant funding

There are no grant monies involved in this research.

Consent Form--English

UNIVERSITY *of*
NORTHERN COLORADO

CONSENT FORM FOR HUMAN
PARTICIPANTS IN
RESERACHUNIVERSITY OF
NORTHERN COLORADO

Project Title: Student Collaboration in Hybrid Classrooms Using PBWorks: A Study
of University Students in Najran, Saudi Arabia

Researcher: Hadi Almonuf, Ph.D.
School of Education Technology

Phone Number: (719) 232-2666

e-mail: almo2005@bears.unco.edu

With the help of several graduate student instructors I am researching student
performance and attitude toward using wikis to collaborate in a hybrid course. As a
participant in this research, you will be asked to take two objective quizzes (which will
not count toward your grade in the class) and a questionnaire. These will be given to
you during your regularly scheduled class sometime during the course of the semester.
The objective quizzes will consist of multiple-choice questions and will assess your
knowledge about the topic of interest during a certain week in the semester. The
questionnaire will require you to assess your attitude about various features of class
exercises and activities. Some items of the questionnaire will seem more like test
questions, but they are intended to assess your critical thinking skills. The quizzes will
each take approximately 15-20 minutes and the questionnaire will take 10-20 minutes.
At the end of the semester, you will be asked to provide some feedback about the class
exercises.

For the quizzes and questionnaires, you will not provide your name, but will be asked to
provide your class section, gender, and overall grade point average. Therefore, your
responses will be anonymous. Only the researcher and the other course instructors will
examine individual responses. Quiz and questionnaire responses will be made on a sheet
which will be computer-graded and written feedback asked for at the end of the semester
will not be examined until after grades have been assigned. Results of the study will be
presented in group form only (e.g., averages) and all original paperwork will be kept in
locked cabinets on campus.

Risks to you are minimal. You may feel anxious or frustrated taking the quizzes, but we are trying to minimize these feelings because the results will have no bearing on your final grade. The benefits to you include gaining practice in taking quizzes, especially with respect to the material in this course. In addition, the approaches we present in these class exercises may help you learn the material better and therefore, make you better prepared for assessments later in the semester (e.g., final exams).

Participation is voluntary. You may decide not to participate in this study and if you begin participation you may still decide to stop and withdraw at any time. Your decision will be respected and will not result in loss of benefits to which you are otherwise entitled. Having read the above and having had an opportunity to ask any questions, please complete the questionnaire if you would like to participate in this research. By completing the questionnaire, you will give us permission for your participation. You may keep this form for future reference. If you have any concerns about your selection or treatment as a research participant, please contact Sherry May, IRB Administrator, Office of Sponsored Programs, Kepner Hall, University of Northern Colorado Greeley, CO 80639; 970-351-1910.

_____   _____

Subject's Signature   Date

_____   _____

Researcher's Signature   Date

IRB Consent Form--Arabic

جامعة شمال كلورادو

نموذج الموافقة للمشاركين في أبحاث جامعة شمال كلورادو

عنوان المشروع : تعاون الطلبة في الفصول المختلطة بإستخدام أعمال PB : طلاب الجامعة في نجران , المملكة العربية السعودية.

الباحث : هادي المنوف , دكتوراه من مدرسة تكنولوجيا التعليم

رقم الهاتف : 2666-232 (719)

من خلال مساعدة العديد من معلمي طلبة الدراسات العليا فقد قمنا بالبحث هنا عن أداء الطالب وتوجهه تجاه استخدام الويكيس وذلك من أجل التعاون في الكورس المختلط/الهجين. وبصفتي مشارك في هذا البحث فأنت سوف تكون مطالب بأن تجيب على امتحانين موضعيين والتي سوف يتم وضعها في الحسبان في تقديرك أما الاستبيان أو الاستطلاع فإنه لن يكون مهما فيما يتعلق بتقديرك. وسوف يتم إعطاءك مثل هذه الاستطلاعات أو الأسئلة أثناء أوقات الدراسة وأحيانا أخرى أثناء الفصل الدراسي. الاسئلة الموضوعية ستتألف من العديد من الأسئلة الاختيارية المتعددة وهذه الأسئلة سوف تقيم معرفتك عن الموضوع الأكثر أهمية خلال اسبوع محدد في الفصل الدراسي. كما أن الاستطلاع سيقوم بعمل تقييم كذلك لتوجهك فيما يخص مميزات التمارين أو التدريبات التي يتم ممارستها في الفصل وكذلك النشاطات. بعض بنود الاستبيان سوف تبدو أنها أسئلة اختبار أكثر من أي شيء آخر لكنها في الأساس وضعتك لتقيم مهارات التفكير النقدي لديك. الأسئلة سوف تستغرق وقت تقريبيا ما بين 15 إلى 20 دقيقة والاستبيان سيستغرق من 10 إلى 20 دقيقة.

بالنسبة للامتحانات أو الأسئلة والاستبيانات فلن تقوم بتسجيل اسمك عليها لكنك سوف تكون مطالبا بكتابة قسمك والجنس ومعدلك التراكمي. وبالتالي فإن استجاباتك أو إجاباتك لن يتم التعرف عليها. فقط الباحث والمدربين سوف يختبروا استجاباتك الفردية. إجاباتك الخاصة على الأسئلة والاستبيان سوف يتم إعدادها على جهاز الكمبيوتر وسوف يتم تقييمها كذلك من خلال الكمبيوتر وسوف يتم طلب الملاحظات المطلوبة وذلك عند نهاية الفصل الدراسي حيث أنه لن يكون بإمكانك البدء في الامتحانات إلا بعد أن يتم تعيين

الدرجات التي حصلت عليها. نتائج الدراسة التي تم القيام بها سوف يتم عرضها على شكل مجموعات فقط (مثال : المعدلات) وكافة الأوراق الأصلية للدارسة سوف يتم الاحتفاظ بها في خزائن مغلقة في الجامعة.

المخاطر التي ستواجها ضئيلة جدا. ربما تستشعر ببعض القلق أو الاحباط وذلك عند التعرض لاختبار ما لكننا نحاول أن نقلص من حجم هذه المشاعر وذلك لأنه مهما كانت النتيجة التي ستحصل عليها فإنها لن تؤثر أو يتم تحميلها على معدلك النهائي. الفوائد التي سوف تعود عليك هي الاشتراك والتدرب على مثل هذه النوعية من الأسئلة الكويزس خاصة مع الأخذ في الاعتبار جوهر هذا الكورس. بالإضافة إلى ذلك فإن المناهج أو المقاربات التي نقدمها في هذه التمارين الفصلية ربما سوف تساعدك على تعلم المادة بشكل أفضل وبالتالي سوف تجعلك مستعدا بشكل أكبر للتقييمات اللاحقة في الفصل الدراسية على سبيل المثال (الامتحانات النهائية).

المشاركة في الأعمال التطوعية. ربما تقرر أنك لن تشارك في مثل هذه الدراسة وإذا ما قررت المشاركة فإنك ربما ما تزال مصرا على التوقف والانسحاب في أي وقت. قرارك هذا سيتم احترامه ولن ينتج عنه أي خسارة أو فقدان للفوائد أو المزايا التي يحق لك الحصول عليها. إقراء ما قم بذكره بالأعلى واستغل الفرصة من أجل سؤال أي شيء تريد السؤال عنه من فضلك قم بتعبئة الاستبيان وذلك إذا رغبت في المشاركة في هذا البحث. عن طريق تعبئة هذا الاستبيان فإنك بهذا سوف تعطينا تصريحا بمشاركتك. وربما سوف تحتفظ بهذا النموذج كمرجع في المستقبل. إذا كانت لديك أية اهتمامات أو قلق فيما يتعلق بإختياراتك أو التعامل بإعتبارك مشاركا في هذا البحث فمن فضلك تواصل مع Sherry May, IRB Administrator مكتب برامج الرعاية, قاعة كينبر , جامعة كلورادو الشمالية غريلي, 1910-351-970; CO 80639.

Subject's Signature   Date

Researcher's Signature   Date

Institutional Review Board Approval

Institutional Review Board

DATE:	May 4, 2016
TO:	Hadi Almonuf
FROM:	University of Northern Colorado (UNCO) IRB
PROJECT TITLE:	[894114-1] Student Collaboration in Hybrid Classrooms using PBWorks: A Study of University Students in Najran, Saudi Arabia
SUBMISSION TYPE:	New Project
ACTION:	APPROVAL/VERIFICATION OF EXEMPT STATUS
DECISION DATE:	May 4, 2016
EXPIRATION DATE:	May 4, 2020

Thank you for your submission of New Project materials for this project. The University of Northern Colorado (UNCO) IRB approves this project and verifies its status as EXEMPT according to federal IRB regulations.

Hadi -

Thank you for your patience with the IRB process. Your materials are clear and your research is interesting.

Please add your research advisor's name and contact information to the consent form before use and be sure to use this consent form at the beginning of the electronic survey rather than the document in the appendix of your narrative to recruit participants and collect data.

Best wishes with your study.

Sincerely,

Dr. Megan Stellino, UNC IRB Co-Chair

We will retain a copy of this correspondence within our records for a duration of 4 years.

If you have any questions, please contact Sherry May at 970-351-1910 or Sherry.May@unco.edu. Please include your project title and reference number in all correspondence with this committee.

This letter has been electronically signed in accordance with all applicable regulations, and a copy is retained within University of Northern Colorado (UNCO) IRB's records.

Generated on IRBNet

APPENDIX B

PBWORKS LEARNER HANDOUTS

PBWORKS LEARNER HANDOUTS

This is a screen shot of the sign up page the researcher used to set up the accounts used for the study.

The researcher's page created for this study.
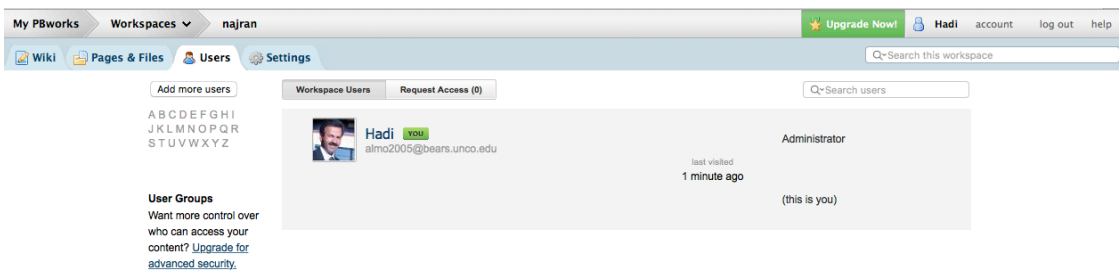
This page was used by the researcher to add users. All user names were random and allowed for anonymity.
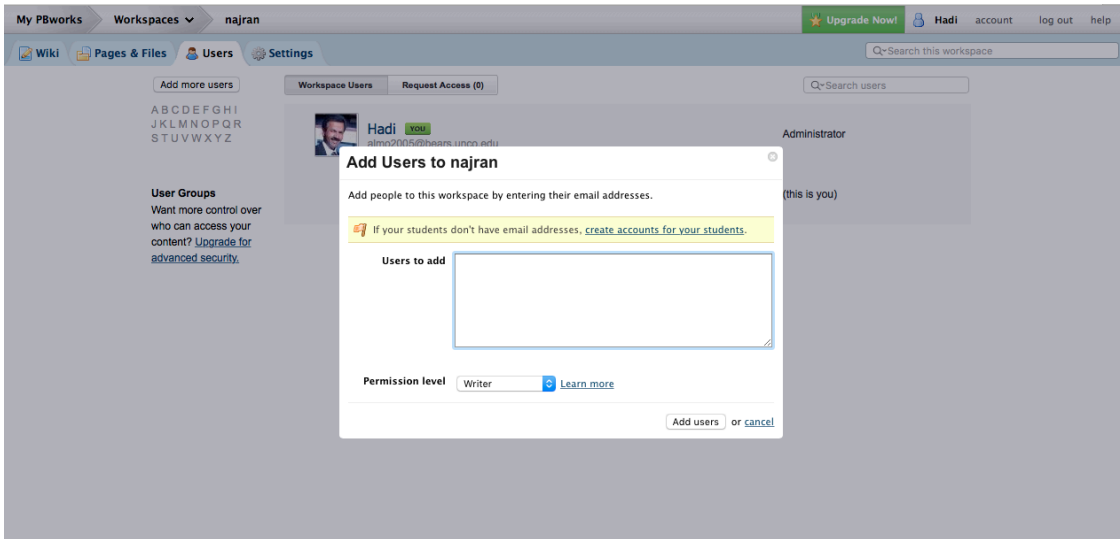
User groups were also set up to allow for anonymity.

Here are the workspaces for each group

A screenshot of how students can add comments and how PBWorks identifies each entry.

APPENDIX C

ATTITUDE SURVEY (ENGLISH AND ARABIC)

Survey--English version

SURVEY ON COLLABORATIVE LEARNING

	Items	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
1	We appointed a coordinator for our group.					
2	As a group we synthesised and reviewed periodically ideas expressed by the group members.					
3	As a group we reviewed periodically our work procedures.					
4	We appointed explicitly who the group leader is.					
5	As a group we determined our goals and our work procedures.					
6	I would remind group members who don't work together properly.					
7	We divided roles for each group member specifically.					
8	Supportive disagreements could be used used to reach general disagreement on certain topics.					
9	The group members reminded each other to hold the plan.					
10	Group members accepted suggestions from others, therefore consensus was reached.					
11	All group members should participate in reaching consensus in a discussion.					
12	In my opinion, our group collaborated well on the assignment.					

	Items	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
13	In my opinion, all group members worked equally in order to complete the task.					
14	I checked periodically the progress of other group members on their tasks.					
15	During the course I mediated disagreements among group members.					
16	I reminded the other group members when the deadline was nearby.					
17	I had responsibility to follow our working plan.					
18	I had responsibility to motivate group members.					
19	I asked for explanation if other group members gave unclear feedback.					
20	I asked for explanation if other group members' opinion was unclear.					
21	I discussed and gave feedback to the others' work					
22	I helped other group members if they had difficulties with learning materials.					
23	As group members did not know how they must go further, I helped them.					
24	I appreciated the group member who reminded me to the deadline of task.					

	Items	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
25	I appreciated other group members who asked my learning progress.					

Survey--Arabic Version

استبانة عن التعليم الالكتروني

معترض بشدة	معترض	محايد	موافق	موافق بشدة	البنود	م
					لقد قمنا بتعيين منسق لمجموعتنا .	1
					لقد قمنا وبشكل جماعي بعمل ومن ثم مراجعة الأفكار المقدمة من قبل أعضاء المجموعة بشكل دوري .	2
					لقد قمنا بمراجعة إجراءات عملنا دوري كفريق عمل واحد .	3
					قمنا بتعيين قائد للمجموعة أجمع عليه كل أعضاء المجموعة .	4
					لقد قمنا وبشكل جماعي بتحديد أهدافنا وإجراءات عملنا .	5
					قمت بتنبيه أعضاء المجموعة إذا لم يقوموا بالعمل مع بعض بشكل جيد .	6
					لقد قمنا بتوزيع المهام بدقة بين أعضاء المجموعة .	7
					تم استخدام الاختلافات البناءة بين أعضاء المجموعة للوصول الى اختلافات عامة في مواضيع معينة .	8

معترض بشدة	معترض	محايد	موافق	موافق بشدة	البنود	م
					قام أعضاء الفرق بتذكير بعضهم البعض للحفاظ على سير الخطة بالشكل السليم .	9
					أعضاء الفريق تقبلوا الإقتراحات المقدمة من الاخرين ودائما ماتم التوصل الى إتفاف .	10
					في أي نقاش يجب أن يشارك كل أعضاء المجموعة في الوصول الى اجماع يتفق عليه الجميع .	11
					بإعتقادي أن أعضاء مجموعتي قد تعاونوا بشكل جيد في الواجبات المطلوبة منهم .	12
					بإعتقادي أن كل أعضاء المجموعة عملوا بشكل متساو لإنهاء المهمة المناطة بهم .	13
					لقد قمت وبشكل دوري بمتابعة تقدم أعضاء المجموعة في أدائهم للمهمات المناطة بهم .	14
					لقد قمت خلال الكورس الدراسي بالتوسط لحل اختلافات بين اعضاء المجموعة .	15
					لقد قمت بتنبيه أعضاء المجموعة الاخرين عند اقتراب المواعيد النهائية لتسليم واجباتهم .	16

معترض بشدة	معترض	محايد	موافق	موافق بشدة	البنود	م
					كنت مسؤولا عن متابعة سير خطة العمل .	17
					كنت مسؤولا عن تحفيز اعضاء المجموعة الاخرين .	18
					لقد طلبت شرحا إضافيا من أعضاء الفريق الأخرين عند تقديم ردود غير واضحة بما فيه الكفاية .	19
					لقد طلبت شرحا إضافيا من أعضاء الفريق الأخرين عند تقديم آراء غير واضحة بما فيه الكفاية .	20
					قمت بمناقشة وإعطاء تغذية راجعة لأعضاء المجموعة الاخرين .	21
					لقد قمت بمساعدة أعضاء المجموعة الاخرين عند مواجهتهم اية صعوبات في المادة التعليمية .	22
					لقد قمت بمساعدة أعضاء المجموعة عندما لم يكن بمقدورهم الاستمرار في التعلم .	23
					قمت بشكر أعضاء الفريق الذين قاموا بتذكيري بموعد تسليم الواجبات.	24
					قمت بشكر اعضاء الفريق الذين قاموا بسؤالي عن تقدمي الدراسي .	25