A Times Series Study: Student Perceptions on Multimedia Discussion Features' Impact on Student Learning and Student Achievement

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ABSTRACT

This study sought to determine the students' perception of VoiceThread discussion multimedia features' impact on their learning and examine the effects of the multimedia features in VoiceThread discussions on student achievement in online classes. The study was conducted at a technical college in southwest Georgia during summer semester 2014. Based on the Operational Report FY 2012 provided to the Business Administrative Technology (BAT) department, this course under study had shown student performance to be consistently lower in online sections (general mean of 63.1%) than traditional, face-to-face sections (general mean of 77.75%). Recommendations were made by the BAT faculty, which included more student interaction and engagement through creative discussions. The Cognitive Theory of Multimedia served as this study's conceptual framework to support that learning can be more successful if incoming information can be presented in multiple sensory memory channels for learners to process information.

The sample for this study included students already pre-registered in two online and two face-to-face sections of the course, which resulted in convenience sampling. This study used a quasi-experimental control group time series research design to determine if a specific treatment influenced student learning and student achievement. Data collection included six assessments, a course evaluation survey, and a multimedia questionnaire. A series of six assessments were used to determine how the multimedia tool, VoiceThread, affected student achievement in online learning. The course evaluation survey was administered to determine how the opinions and attitudes about the course differed between students in the control and treatment groups. Additionally, a multimedia

questionnaire was administered to determine the opinions of students in the treatment group regarding the technology and its impact on the course. Descriptive statistics, comparison of means for independent samples (*t* test), and multivariate analysis of variance (MANOVA) were used for data analysis. Content analysis technique was also used to identify themes and trends for qualitative data collected through open-ended survey items and the comment section of the two surveys.

The findings of this study revealed no statistical significant difference between the treatment and control groups, but the student achievement for both groups were comparable based on the assessment mean scores. The course evaluation survey results indicated that the difference between the control and treatment groups was small, but both groups responded very positively about the course. The multimedia questionnaire responses indicated the usage of the multimedia tool, VoiceThread, was mostly positive for the students in the treatment group. Overall, the control and treatment groups were comparable in achievement, attitude, and opinion in the effectiveness of the course. Based on these results the two groups were comparable.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

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DEDICATION

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Chapter I

INTRODUCTION

Student engagement has helped ensure that students are active participants in the process of learning. Research has supported the educational benefits from the increase of student engagement (Mandernach, 2009b). Nevertheless, there have been many challenges associated with meaningful student engagement, even more so in an online environment. According to Mandernach (2009b), the importance of student engagement is more pronounced in the online classroom due to the physically isolated environment. Other challenges could stem from the student's interest in the topic, attitude about learning, willingness to dedicate the necessary personal time and effort in learning the materials, or belief of mastering the course concepts (Mandernach, 2009b). Reisetter & Boris (2004) identified four types of student perceptions of barriers in online learning: situational (responsibilities, obligations, and environment), institutional (students' access to use the online environment), dispositional (personal background, attitudes, and self-regulation skills), and epistemological (belief about the effectiveness of online learning). Lack of connectedness and face-to-face communication and feeling of isolation were also identified as critical elements (Reisetter & Boris, 2004). Additionally, a recent study placed technological obstacles as the top category of online learning barriers due to students' technological skills (Agosto, Rozaklis, MacDonald, & Abels, 2010).

Keeping students motivated has also been challenging in higher education, especially for delivery of complex material (Ganah, 2012). According to Toshalis &

Nakkula (2012), a prerequisite to implementing student-centered learning would be knowing what motivates and engages students. Although there is not a particular motivational pathway or specific type of engagement that ensures student achievement, research has shown a definite linkage with achievement and motivation (Toshalis & Nakkula, 2012):

> To feel motivated to do something and become engaged in its activity, youth (like adults) generally need to feel they have a voice in how it is conducted and an impact on how it concludes. Research has shown that the more educators give their students choice, control, challenge, and opportunities for collaboration, the more their motivation and engagement are likely to rise. (Toshalis & Nakkula, 2012, p. 32)

Consequently, the online environment has required more interaction, collaboration, and engagement in order to encourage learning and gain higher-level thinking (Ko & Rossen, 2010). Innovative approaches and teaching strategies are needed for online educators to go beyond simple active learning and create a learning environment that promotes, fosters, and stimulates the students' affective, motivational, and persistence characteristics (Mandernach, 2009b). Interactive tasks that include multimedia could guide online learning activities, accommodate the various learning styles, highlight the students' understanding, and ultimately, provide ways to promote student engagement and achievement in online learning (Mandernach, 2009b). Ganah (2012) suggested that multimedia tools might also help students with low-level motivation when it is well-designed into instruction. Mayer's (2011) review of studies on motivation and new media further emphasized how technology-supported learning

environments might provide features such as collaboration to promote student motivation.

Online courses have been one of the most common deliveries of instruction for today's students (Ko & Rossen, 2010). Based on an online national survey, students taking at least one online course had more than doubled over a 5-year period (Allen, Seaman, & Sloan, 2007). Educators have been learning how best to adapt their teaching to the new environment and have constantly been creative by thinking of ways to enhance the online teaching-learning process (Ko & Rossen, 2010). These new developments had been incorporated through online instructional methods to better accommodate the learning styles or individual needs of students. This approach has provided the same quality and effectiveness as the traditional classroom setting (Ko & Rossen, 2010). In creating and delivering online instruction, several accommodations should be considered to effectively convey the course materials and help ensure learning.

Technological advances such as multimedia tools have vastly changed the view of online interactions with students (Lehman & Conceicao, 2010). Multimedia tools have provided combinations of verbal and non-verbal presentation modes, such as narration and on-screen text, graphics, video, animations, and environmental sounds, in one learning object (Moreno & Mayer, 1999). The usage of only text is not considered sufficient to help online learners process information and make learning effective, efficient, and engaging (Hong, 2010). According to Johnson (2011), creating a learning environment using e-tools supports teaching strategies in an engaging context that learners find relevant. Moreover, e-tools such as VoiceThread encourage collaboration

and engagement through cloud-based group conversation that incorporates audio, pictures, documents, and video (Johnson, 2011):

> VoiceThread allows users to engage in a virtual conversation using visuals, voice, and documents. This highly collaborative environment, located at www.voicethread.com, promotes focused discussions around images, video, or documents that are uploaded and commented upon by the VoiceThread's creator. Users can then log in and comment on the item in five ways: through text, with a microphone, over the telephone, via webcam video, or with an audio file. (Johnson, 2011, p. 90)

Conceptual Framework

The conceptual framework for this study was the Cognitive Theory of Multimedia, which is based on an assumption that learning can be more successful if incoming information can be presented in multiple sensory memory channels, such as auditory and visual, for processing information at the same time (Mayer, 2001). Mayer also further described the Cognitive Theory of Multimedia as a research-based theory of learning that focuses on explaining learning from words and pictures.

> The case for multimedia learning is based on the idea that instructional messages should be designed in light of how the human mind works. Let's assume that humans have two information processing systems—one for verbal material and one for visual material. Let's also acknowledge that the major format for presenting instructional material is verbal. The rationale for multimedia presentations—that is, presenting words and pictures—is that it takes advantage of the full capacity of humans for processing information. When we present

material online in the verbal mode, we are ignoring the potential contribution of our capacity to process material in the visual mode as well. (Mayer, 2001, p. 6)

The characteristics identified in the Cognitive Theory of Multimedia align closely with VoiceThread, a multimedia discussion tool. VoiceThreading has been known for incorporating digital media to drive conversations, communicating information through more than one of the senses, connecting with learners in an authentic and simple manner, and promoting discussions that stimulate a live presence (VoiceThread, 2014). "Text alone can't deliver the subtlety and expression required for meaningful connection. If text were enough, we wouldn't use emoticons, get on planes, or use web-conferencing software. VoiceThreading is a more human way to connect" (VoiceThread, 2014, Presence section).

The conceptual framework properly framed this study and helped confirm the understanding of a relationship between multimedia tools and student achievement in online learning.

Context

Literature had expanded to compare online learning versus the traditional, face-to-face format (Dillon, Dworkin, Gengler, & Olson, 2008). Over time, the comparison in college courses across various disciplines had indicated no difference in student achievement. However, studies have also shown contradictory findings (Dillon, Dworkin, Gengler, & Olson, 2008). According to Verhoeven & Wakeling (2011), a large public university conducted a study to compare student achievement in the online and face-to-face format delivery methods for a quantitative methods business course. The study included 373 undergraduate students (161 online, 212 face-to-face) enrolled in eight

sections of QM 3000 for four consecutive fall and spring terms. Each term consisted of the same instructor for one online and one face-to-face section. The findings indicated the success rate was significantly lower for the online students (55.3%) than the face-to-face students (72.6%). The success rate was identified as the percentage of enrolled students earning a grade of A, B, or C in the course. Additionally, a recent study looked at comparison of online and face-to-face instruction with an analysis of gender and course format for undergraduate business statistics courses. The study included 234 students (145 online, 89 face-to-face) enrolled in BA 302 with the same instructor for both sections. The results indicated that students' overall performance (final grades), without considering gender, was better in face-to-face than in online classes (Flanagan, 2012).

In July 2012, instructors in the area of Business Administrative Technology (BAT) at Albany Technical College in Albany, Georgia, provided overall course averages for summer 2011, fall 2011, and spring 2012 terms for the closing of the Operational Report FY 2012. In addition, overall course averages that did not meet the 70% percentile required instructors submit an analysis of the course averages, reasons the percentile was not met, and recommendations that could improve the overall average course scores. The report indicated eleven BUSN 1440 courses were assessed for summer 2011, fall 2011, and spring 2012 terms with an overall performance of 68.18%. The report findings showed the online environment was below the 70% percentile with online averages of 71, 61, 68, 55, 67, 65, and 55, with a general mean of 63.1%, while classroom (face-to-face format) averages were 72, 78, 74, and 87, with a general mean of 77.75%. After reviewing the results, the instructors identified strengths and weaknesses. Based on the instructors' observation and perception, one strength indicated students'

motivational attitudes were at a higher level in the face-to-face environment. Furthermore, weaknesses were displayed in the report, which indicated that students' lack of motivation could be due to various influences (internal and external factors) such as work, health, family, environment, learning styles, and/or interest in learning. Recommendations were made to help achieve the desired outcome, which included more interactive and engaging instruction such as creative discussions (Albany Technical College, 2012).

More specifically, BUSN 1440, CRN# 40796, was identified as one of the spring 2012 online courses that did not have an overall course average in the 70% percentile (see Figures 1 and 2). The course included 22 students with final grades of: A (1 student), B (6 students), C (3 students), D (2 students) and F (10 students), having a pass rate of 55% for the course. The course consisted of four categories that accounted for a certain percentage of the final grade (Lessons 40%, Timed Writings 20%, Exams 20% and Work Ethics/Library 20%). In reviewing the breakdown of scores for each category, the instructors were most concerned with the sporadic occurrences in completion of assignments. It was also noted that some of the students tapered off towards the end of the semester and did not complete some of the major assignments. The overall course average for the specific categories included 54% Lessons, 35% Timed Writings, 34% Exams, and 40% Work Ethics/Library (Albany Technical College, 2012).

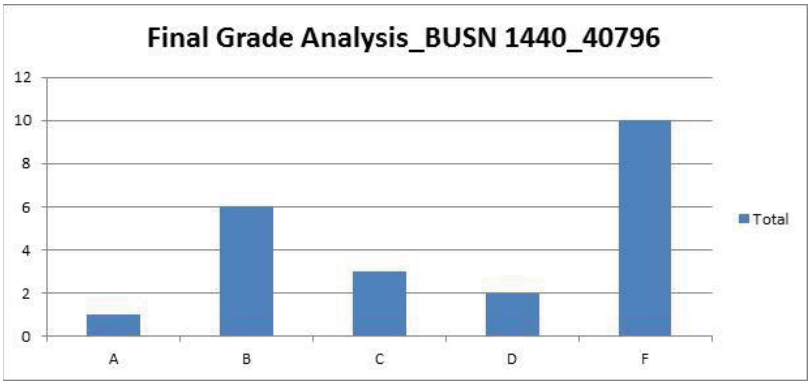

Figure 1. *Final Grade Analysis*

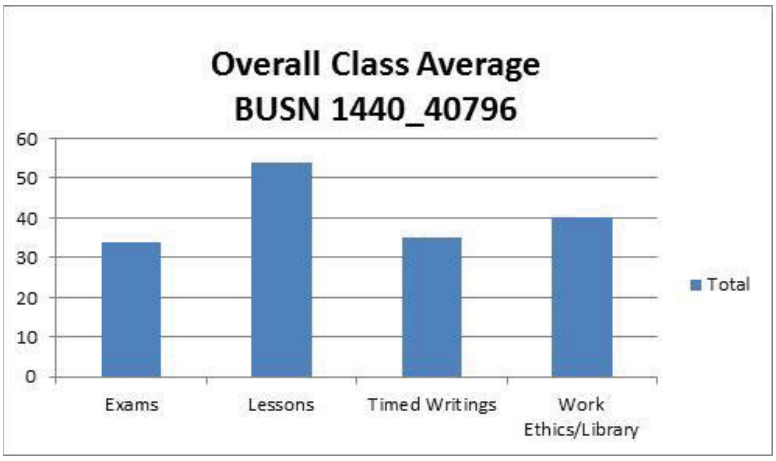

Figure 2. *Overall Class Average*

Multimedia Discussion Tool

For this study, VoiceThread was used as a multimedia presentation tool to promote more student interaction and engagement through cloud-based discussions. For each discussion, students were provided a discussion link by e-mail from the instructor to enter an online discussion forum, listen to the audio and/or read the text message from the instructor for the discussion instructions, and then comment based on the instructions provided. The discussion forum included an imported or uploaded media (graphics and/or

a video) pertinent to the course topic and shown as a large slide in the center of the screen that comments surrounded. Students automatically heard the instructor's comment first then were allowed to click the comment button to leave a comment as a discussion post. Students could leave comments five different ways using voice (with a microphone or telephone), text, audio file, or video (with a webcam). A comment bubble along with the student's loaded photo represented a discussion post made by each student. Each time a comment was made, the discussion forum developed from each comment around the center slide and became a group conversation about the topic. Students were able to revisit the link and hear or read discussion posts from their instructor and peers. Once all posts were made, the discussion forum was exported as an archival video for the class (see Figure 3 for an illustration of VoiceThread).

Figure 3. *VoiceThread Illustration*

Panettieri (2013) used teaching techniques to explore the possibility of incorporating VoiceThread to help radiologic technology students develop verbal and nonverbal skills through communication and collaboration on various topics. The tool included images, documents, and videos to assist with transferring academic aptitudes to the clinical environment. Ultimately, the tool created ways to explore new methods of instruction while allowing students to be active participants in the learning process.

In fall 2012, an online section of Document Production, BUSN 1440 (CRN# 22868), at Albany Technical College implemented cloud-based discussions using VoiceThread to help increase teacher-to-student and student-to-student interaction. The discussions included videos to demonstrate more complex tasks such as reports, tables, table of contents, and legal documents. The online discussions included features for today's learning culture, such as post by text, webcam, and voice (cell phone or microphone), as well as videos from YouTube. Students completed the online discussions after they submitted each group of assignments. As a result, students were able to reflect on their learning process, evaluate/comment on the experience, and share new knowledge from viewing the videos provided for discussion. The course consisted of five categories that accounted for a certain percentage of the final grade (Lessons 30%, Online Discussions 10%, Timed Writings 20%, Exams 20% and Work Ethics/Library 20%). There was uncertainty to what degree of the percentage the instructional strategy contributed to the students' motivation and involvement in the course; however, the overall course average was at the 80% percentile in comparison to previous online sections that were below the 70% percentile.

Cloud-based discussions using VoiceThread were implemented again in BUSN 1440 online sections for spring 2013, summer 2013, and fall 2013. As indicated below in Table 1, the overall course averages showed above the 70% percentile except for spring 2013:

Table 1. *Overall Course Averages*

Semester	CRN#	Overall Course Average
Spring 2013	40519	63% percentile
Summer 2013	60341	78% percentile
Fall 2013	20734	86% percentile
Fall 2013	20815	85% percentile

The Problem

The problem investigated in this study is that student performance in Business Administrative Technology online classes at Albany Technical College has been consistently low.

The Purpose

The purpose of this study is to examine the effects of the multimedia features in VoiceThread discussions on student achievement in online classes and determine the students' perception of VoiceThread discussion multimedia features' impact on their learning.

Research Questions

This study is guided by the following research questions:

1. How does using the multimedia discussion tool, VoiceThread, affect student achievement in online learning?
2. How are the opinions and attitudes about the BUSN 1440 course different between students that used multimedia and students that used only text for class discussions?
3. In the section of the BUSN 1440 course that utilized the multimedia discussion tool, VoiceThread, for class discussions, what were the opinions of the students about the technology and its impact on the course?

Scope and Limitations

1. The study's scope included one subject area course, BUSN 1440, with two online sections and two face-to-face sections within the Business Administrative Technology Program at Albany Technical College.
2. The sample for the study was obtained using convenience sampling.
3. The study was conducted at one technical college in southwest Georgia. This limits the generalizability of study results.
4. The study was completed in summer 2014, which consisted of 10 weeks in the semester, whereas the average fall or spring semester is 16 weeks. This timeframe may have limited study results.
5. Four instructors taught the courses included in the study, and it is unknown what, if any, effect variations in teaching styles may have had on the students' achievement.

Conceptual and Operational Definitions

E-tools - Educational tools that are used electronically and are usually housed on the internet (Johnson, 2011).

Multimedia Tools - Technology tools that present information through a combination of video, audio, images, and text into one synchronized learning object (Moreno & Mayer, 1999).

Online Learning - A course where 80% or more of the content is delivered online and typically no face-to-face meetings occur (Allen & Seaman, 2010).

Student Achievement - Final grade earned by the student enrolled in the course.

Student Engagement - The student shows sustained behavioral involvement in learning activities through positive emotions including enthusiasm, optimism, curiosity, and interest (Skinner & Belmont, 1993).

Student Motivation - Motivation influences and maintains the student's efforts to engage in cognitive processing in order to make sense of the course materials to be learned (Mayer, 2011).

Web 2.0 Tools - Tools that are second generation of the Internet, where users receive content as well as create their own content and publish to the Web (Johnson, 2011).

Significance of the Study

This study is a significant endeavor in promoting student achievement in the online environment. The multimedia tool, VoiceThread, is intended to promote student collaboration and allow educators to present course content in a new way, which displays combined media including images, text, video, audio, and Web links to create engaging

and content-focused class discussions to simulate a live presence. This study better established if student achievement and student learning can be positively impacted by using VoiceThread discussion multimedia features.

Chapter II

REVIEW OF THE LITERATURE

The exploration of new media marks one of the most important trends today in the education arena. The increasing growth of online learning has prompted attention for faculty to examine the role of multimedia in their course content (Mandernach, 2009b). Research has been conducted to support the role of multimedia as it influences essential motivational variables. However, some of the studies investigated have shown possible limitations such as different geographic locations, less time using multimedia, and various technology tools. The majority of research on the multimedia tool, VoiceThread, provided findings based on K-12 education rather than its discussion features and impact on student learning and achievement in higher education. Additionally, literature of recent studies have shown how online and traditional face-to-face courses are more comparable in student achievement and student learning.

A study was conducted on collaborative learning with the comparison of graduate business students taking courses in an electronic classroom and courses in a traditional classroom setting with the same instructor (Alavi, 1994).The study investigated whether the use of a group decision support system (GDSS) in a collaborative learning process would promote student learning and evaluation of classroom experiences. The findings showed the electronic classroom (classroom with the Vison Quest program) resulted in higher levels of skill development, self-reported learning, and utility. The final test grades of the electronic classroom students were significantly higher than the traditional

classroom students. Although the study focused on one software tool with various capabilities, the experimental study did not include an online environment. One of the limitations of the study included possible interaction among the students because of the same physical environment. The study suggested that future studies be conducted that will limit student interaction at different geographic locations. This study proposed to address the online environment as well as the physical environment to help reduce student interaction.

In 2009, a study was performed to examine the impact of instructor-personalized multimedia as it relates to student engagement (Mandernach, 2009a). The study suggests that the theoretical framework of multimedia promotes learner engagement because active learning occurs when learners engage in three cognitive processes that contribute to the Cognitive Theory of Multimedia: Constructivist Learning Theory, Cognitive Load Theory, and Dual Coding Theory. The procedure was to compare student engagement and learning outcomes among four online courses based on certain conditions. All sections included complete instructional content with basic multimedia supplements throughout the online lectures such as videos and powerpoints. The control condition examined student outcomes based on a fully-designed multimedia-supported course that did not include the addition of instructor personalized multimedia supplements. The other sections had the same as the control condition except they had the addition of the instructor personalized multimedia supplements. The results did not indicate any significant differences in the engagement or learning between any of the various levels of instructor generated multimedia. The study examined the multimedia in a cumulative format rather than comparative and did not address the comparative impact of each of

each type of multimedia. In addition, this study did not examine one specific interactive technology tool that promotes various multimedia. This study proposed to address these factors by using a comparative format as well as examining one specific interactive tool that includes various multimedia.

Web 2.0 tools are among the current technologies to promote interactive and information sharing in collaborative digital environments with the benefits of accessibility and nominal costs, and as a result, have drastically increased the usage in K-12 instruction (Karchmer-Klein & Shinas, 2012). A study was conducted to investigate the modes, semiotic resources, and intersemiotic relationships that are present in the multimodal electronic texts design. The purpose of the study was to examine how educators learned to design multimodal responses based on a course assignment while enrolled in a course that specialized in multimodality. As part of the course activities, each student was required to complete a case narrative and multimodal text and the multimodal texts were created using Glogster, a virtual poster Web 2.0 tool.

The study supported that the Web 2.0 tools such as Glogster do influence the texts created by writers; however, the complexity of the tool might limit students in using all of the features since the data showed that some of the participants were challenged in using some of Glogster's components. Although the study examined the effectiveness of Glogster, it utilized graduate level participants whereas this study proposed to use undergraduate level students to examine the effectiveness of VoiceThread.

Instructional supporting tools can instruct, guide, and scaffold online students in their learning (Karoulis, Stamelos, & Angelis, 2008). A study was done to evaluate the potency and effectiveness of a new instructional tool, the Lesson Sheet. The Lesson Sheet

is in table format and has an outline of the lessons in paragraph form. It also includes charts, graphs, pictures, and other materials related to the course content. The undergraduate online students were divided into two groups, control and experimental. The results indicated a statistically significant difference in student performance with the group that used the instructional tool. Although the Lesson Sheet proved to provide guidance and scaffolding for the online students, further research is needed to transition the tool to be more technology-based such as an interface, URL resources, animation, and adaptive interactions with the students. In addition, the study included an in-person examination, which was used as a test score towards each student's final score. The study examined the effectiveness of a multimedia tool as it relates to student achievement in the online learning environment based on quizzes rather than a test score towards the final score.

The use of a variety of instructional media connects with the increasing diversity among learners (D'Arcy, Eastburn & Bruce, 2009). A study was conducted to determine whether students of different learning styles, majors, and genders benefited from specific instructional media. Nineteen different instructional media were used for instruction in the study and were grouped into visual aids, Web-based tools, face-to-face formats, and paper-based tools. Fourteen of them were used every semester as lecture, handouts, chalkboard, videotapes, small group discussion, whole course discussion, in course writing, outside of course writing, a textbook, a supplemental Web site with text, images, and interactive exercises, online quizzes, and PowerPoint notes that were accessed online. A survey assessed students' perception of the effectiveness of the different media used for instruction. The overall findings of the study showed that a rich ecology of media appears

to enhance student learning. Although the study addressed different instructional media, this study focused on one technology tool that includes multimedia.

As technology is integrated more into K-12 education in the 21st Century, VoiceThread has become known for its potential to support young learners through meaningful and engaging activities and Universal Design for Learning for curriculum design, instructional practices and assessments (Gillis, Luthin, Parette, & Blum, 2012). According to Gillis et al. (2012), VoiceThread has offered several advantages such as inexpensive cost, features for public and private threads, its adaptability in range of classrooms and activities, and doodling feature to appeal and motivate children in draw on the media when comments are created. A recent study promoted virtual collaboration for an early childhood mathematics classroom (Cicconi, 2014). VoiceThread was highlighted for its free, user-friendly, and engaging math activities used to collaborate among teachers and students. According to McLaughlin (2013), VoiceThread has promoted student engagement as a digital tool for multimodal text for common core standards. This type of text will motivate, engage, and inspire young learners in lessons created. Middle school teachers have even used VoiceThread for language arts where students can write, illustrate, and talk about poetry in the virtual environment (Wood, Stover, & Kissel, 2013).

In recent years, higher education has taken a closer look at the advantages of VoiceThread to assist with the increasing accountability for student learning to promote interactive multimedia discussions (Koricich, 2013). In 2013, a study was conducted to examine student experiences with the usage of VoiceThread for a graduate online course (Yu-Hui & Yu-Chang, 2013). The goal of the study was to evaluate the perception of the

students for collaboration and knowledge sharing. It was noted that most of the participants for the study were K-12 teachers enrolled as graduate students. A survey was administered to determine the participants' experiences, perceived benefits, and preferences of using VoiceThread. Overall, the results indicated that the graduate students had very positive experiences in using the multimedia tool. However, challenges were identified as access issues and locations of more than one discussion using different URLs. Also, participants did not respond to their peers, which limited interaction among the students.

Online versus traditional instruction has emerged in recent literature to show online learning as being a comparable to traditional face-to-face courses. A recent study was conducted at Hampton University to determine student perceptions of learning and course satisfaction for an undergraduate business course offered online for the first time (Simon, Jackson, & Maxwell, 2013). Students met face-to-face on the first day of class to be notified that the sections were online rather than traditional face-to-face format. Two sections of the four were offered in an online format with a maximum enrollment of 35 students in each section. A pilot study was conducted to help ensure the feasibility and sustainability of the four in the Business Management department. Students were asked to complete a survey on the first day of class to determine their experience with technology and online learning. Students also completed another survey on the last day of class to determine their online learning experience in the course as well as the perceptions of the online environment.

The pilot study results indicated 100% of the students using computer applications; however, 97% completed the work using the computer applications without

any issues. The data collected also reported that 22% had never taken online classes, 32% of the students said they had a good experience in the online course, 52% of the students said they would have taken the class even if they had already known it was online, and 97% felt comfortable using the computer and new various technologies. Additionally, 33% said it was less time completing course materials than in the traditional face-to-face format, which suggested the instruction was a viable alternative for traditional instruction. The study results showed similar responses as the pilot study based on the responses from the surveys. Additionally, 80% of the students had a successful learning experience as reported for final grades. The concluding comments of the study identified interaction with content, interaction with instructors, and interaction with classmates as being significant for the success of students taking online courses.

Aside from online business courses, online learning versus the traditional classroom has shown no difference in student performance for an immunization elective course offered at the University of Wisconsin School of Pharmacy (Porter, Pitterle, & Hayney, 2014). A recent study was conducted to compare the performance and preferences of students randomly selected to online and traditional face-to-face sections of an immunization course. There were a total of 140 participants in the study, 69 in the traditional classroom and 71 in the online environment. The course activities were the same for both groups; however, the lecture materials were different. Students in both online and face-to-face sections completed a survey to determine their preferences and the results indicated most of the students in the online section preferred the online environment. There was no significant difference in the final grades of the two groups at

the end of the semester and most of the students (68%) reported they would take another online course.

According to Baxter & Kirpalani (2012), students have performed equally in online and face-to-face courses even with some students having challenges in online courses. The study was intended to assess and obtain information about student learning styles and the possibility of those students taking online business courses again. Students were given a two-part assessment provided by the University of South Dakota as a learning style inventory and to determine the likelihood of enrolling in another online course again. The results showed most of the students were visual learners (54% out of 28 students). One of the challenges mentioned for the visual learners was not enough visually appealing information because much of it was in text form. The auditory learners appreciated the ability to read aloud rather than having an online course without any audio components. The kinesthetic learner struggled with not having hands-on experiences in the online environment. This study also demonstrated the need to have more visually stimulating information and audio components to enhance the learning experience and improve retention. Regardless of the learning style, the majority of the students specified they would take another online course.

In further comparison, a study was conducted to investigate and compare student performance in online and face-to-face environments. The study included two groups (69 participants) enrolled in an online section and face-to-face section of an undergraduate course, Theories of Counseling (Lyke & Frank, 2012). Both groups completed the same quizzes at the end of each week and completed an assessment to measure student satisfaction, IDEA instrument. The online group completed the assessment using a link

provided by email and the traditional group used paper and pencil. The results of the study indicated there were no reliable differences in the quiz scores for both groups. The *t* test performed on each group for quiz 1 indicated a significant difference of the online group performing superior to the traditional group, which suggested the online group was either more prepared or more capable in completing quiz 1. In rating the quality of the course, the two groups showed a significant difference with total satisfaction of the course (online-4.0, traditional-4.7) and instructor satisfaction (online-3.8, traditional-4.8). The study suggested future research to determine the relationship between satisfaction and learning outcomes.

Recent studies in other countries have also reported the same findings in comparing online and face-to-face environments. According to Mgutshini (2013), a recent study conducted in South Africa of an undergraduate nursing course indicated that the online group performed just as well as the traditional group in formative and summative assessments and the success of online students were comparable to the traditional students. The study explored how online compares to traditional face-to-face based on content mastery, attrition, and student satisfaction. The study compared the students' academic performance as well as the student satisfaction about their learning experience. Three unit examinations and a questionnaire were administered to both groups that consisted of 61 students, 34 online and 27 traditional, face-to-face. The results reported that the traditional students focused more on the evaluation of the instructor and the relationship with the class when describing an overall experience of the class. By contrast, the online students focused on a more multi-factorial assessment regarding the instructor and the teaching style. Overall, the results of the study indicated

that the online students had a comparable education success and reported more learner satisfaction.

Chapter III

METHODOLOGY

This study used a quantitative research design to examine the effects of the multimedia features in VoiceThread discussions on student achievement in online classes and determine the students' perception of VoiceThread discussion multimedia features' impact on their learning by comparing a group that used traditional online discussion (text only) with one that used a cloud-based discussion tool that includes multimedia. The use of the cloud-based discussion tool, VoiceThread, was the independent variable (treatment), while student achievement and attitude towards the course and the multimedia technology were the dependent variables. According to Creswell (2009), quantitative research is a way to examine the relationship among variables, and in turn, measure the variables using an instrument in order for numbered data to be analyzed using statistical procedures. Additionally, quantitative research addressed the problem by understanding what variables influence an outcome.

Research Design

This study used quasi-experimental control group time series research design to determine if a specific treatment influenced student learning. Quasi-experimental designs most often uses intact groups that seem to be similar as the treatment and control groups, such as two comparable classrooms or schools (Trochim, 2006). According to Fraenkel, Wallen, and Hyun (2012), the time-series design includes occurrences of measurements or observations over a period of time both before and after the treatment. Additionally,

the time-series design also gives an understanding on the progression of the effects of treatment (implementation of the intervention) throughout that period of time (Gottman, McFall, & Barnett, 1969). As shown in Figure 4 below, the dependent variable occurs until the independent variable (treatment) is introduced. O_i indicates repeated measurements or observations used for both control and treatment groups, while X is the treatment applied to the treatment group.

O_1	O_2	O_3	X	O_4	O_5	O_6
O_1	O_2	O_3		O_4	O_5	O_6

Figure 4. A Basic Control Group Time-Series Design

Population and Sample

The study sample was selected from the student population of Albany Technical College located in southwest Georgia. The study was conducted during summer semester 2014 with college enrollment of 3,245. The sample (N= 62) for this study was students enrolled in two online sections and two face-to-face sections of BUSN 1440 Document Production. The study included 35 students in the control group and 27 students in the treatment group.

BUSN 1440 Document Production is a 4-credit hour course that is part of the Business Administrative Technology (BAT) curriculum at the college. Document Production is a required course for BAT, Accounting, and Medical Assisting diploma and degree programs. The course reinforces the touch system of keyboarding, placing emphasis on correct techniques with adequate speed and accuracy and producing properly formatted business documents. Topics include: reinforcing correct keyboarding

technique, building speed and accuracy, formatting business documents, language arts, proofreading, and work area management. The pre-requisite for Document Production is BUSN 1100 Introduction to Keyboarding, which introduces the touch system of keyboarding and places emphasis on correct techniques, or the ability to key 25 gross words a minute on 3-minute timings with no more than 3 errors. The co-requisite is COMP 1000 Introduction to Computers, which places emphasis on basic functions and familiarity with computer use. The four BUSN 1440 sections for this study included the required standards mandated by Technical College System of Georgia (TCSG). One of the two online sections, which is the treatment group, was augmented with a multimedia cloud-based discussion tool, VoiceThread, for online discussions. The control group consisted of two face-to-face sections and one online section that were not exposed to the multimedia discussion tool and used the Angel Learning Management System (LMS) for text-only online discussions.

According to Fraenkel et al. (2012), researchers may use convenience sampling when groups or individuals are conveniently available for the study rather than using random or a systematic nonrandom sample. For this study, convenience sampling was used, attributable to students being available in four different sections of the Document Production course. The total sample was 62 students with 20 students in one online section and 15 students in the two face-to-face sections (7 in one section, 8 in the other section) for the control group, while 27 students are in another online section as the treatment group. There were four different instructors teaching one section each of the four sections for this study. All four instructors for this study used the same projected learning schedule and syllabus for the course.

Procedures

The study was conducted throughout summer semester 2014 using the four sections of the Document Production course. The sections of the course were taught as online and face-to-face formats. The three sections (one online and two face-to-face sections) that composed the control group were taught by three full-time BAT instructors. The one online section was taught by the researcher for the treatment group. The researcher's experience using VoiceThread included implementation of the multimedia tool in previous BUSN 1440 Document Production online courses during fall 2012, spring 2013, summer 2013, and fall 2013 semesters.

Both online and face-to-face sections used a software application, GREGG College Keyboarding and Document Processing (GDP), to submit weekly folder assignments. The same projected learning schedule (PLS) was used for the four sections. The PLS consisted of 7 weekly lesson folders that included a list of assignments based on course objectives and units covered in GDP. Additionally, six early discussions were included in the PLS to promote a better understanding of the course content covered in weekly lesson folders 2-7. For the control group, online discussions were facilitated during weekly folders 2, 3, 4, 5, 6, and 7 through Angel LMS using text only. For the treatment group, online discussions were facilitated for the same weekly folders; however, online discussions for weekly folders 2, 3, and 5 were facilitated through Angel LMS using text only, while online discussions for weekly folders 4, 6, and 7 that included more complex content were facilitated through the multimedia cloud-based discussion tool, VoiceThread. The online discussion questions are shown in Appendix A.

For the treatment group, students were provided a VoiceThread discussion link by email to complete an online discussion for weekly folders 4, 6, and 7 as each weekly folder became available. Students entered the online discussion forum using the link provided and listened to the audio message from the instructor for the discussion instructions. The discussion forum also included pertinent videos/graphics/media as the central focus of the discussion. Once the students listened to the instructor's audio message and watched the related videos/graphics/media, the students created a comment as a discussion post by using voice (with a microphone or telephone), text, audio file, or webcam. Each time a student saved a comment as a discussion post, the discussion forum developed around the central focus of the discussion (center slide) and became a group conversation about the topic. Students were automatically notified by email each time a post was made for the online discussion and revisited the discussion link to post a response and hear or read discussion posts made by the instructor and peers.

A quiz of 6-8 questions were administered weekly in the Angel LMS for the treatment and control groups after the online discussion and weekly unit assignments were completed for each folder (weekly folders 2-7). A sample quiz is shown in Appendix B. The quizzes assessed students based on the course objectives and content covered for each specific weekly folder. The quizzes focused on terminology, language arts, and formatting techniques (font, font-size, bold, italics, underline, line spacing, alignment, page numbers, numbered lists, bulleted lists, table borders, table shading, font color, and presence of footnotes). Both groups, control and treatment, had the same instructional strategies at the beginning of the semester up to weekly folder 4, which included the online discussion using the multimedia cloud-based discussion tool,

VoiceThread, as the treatment for the treatment group. A total of six quizzes were administered after the online discussions for weekly folders 2-7 for the control and treatment groups to test understanding of concepts and task related skills.

Instrumentation

For this study, six quizzes were included in the projected learning schedule to address Research Question 1 (RQ1) and determine how using the multimedia discussion tool affected student achievement in online learning. See Appendix B for a sample of the quizzes. The quizzes were developed from GDP resources accessible to the instructors. The questions in the quizzes reflected the content (units) covered in each weekly folder as well as collaboration among the four instructors to determine the most essential topics of each unit. The quizzes were created in the Angel LMS and released for students to complete based on each weekly folder, which was the time frame of the weekly online discussions and assignments for the control and treatment groups. The projected learning schedule outlined each week to include three steps in completing course work: step 1 early discussion, step 2 weekly folder assignments, and step 3 folder quiz.

The institution's course evaluation survey was used for both control and treatment groups to address Research Question 2 (RQ2) and identify any differences in the opinions and attitudes about the course between students that used multimedia and students that used only text for class discussions. The course evaluation survey is shown in Appendix F. The survey consists of 19 questions and a comment section on a 5-point Likert scale of measurement: Strongly Agree, Agree, No Opinion, Disagree, and Strongly Disagree. For this study, items 1, 4, 5, 6, 9, 13, 14, 15, 17, 18, and the comments section of the survey were analyzed.

A survey was used for Research Question 3 (RQ3) to address the students' opinions of the technology and its impact. The survey was administered to the course section that utilized the multimedia discussion tool for class discussions. The Multimedia Motivation Questionnaire (MMQ) was used as the instrument to measure the students' levels of motivation in using the multimedia tool (Nkweke, Dirisu, & Umesi, 2012). See Appendix C. MMQ consists of 10 questions on a 4-point Likert scale of measurement: 4 points = Strongly Agree, 3 points = Agree, 2 points = Disagree, and 1 point = Strongly Disagree. This study modified the questions to address VoiceThread as the multimedia cloud-based discussion tool and the subject area course as Document Production. According to Nkweke et al. (2012), MMQ was presented to two Educational Technology specialists and two Biology subject area specialists to examine the instrument's content validity, clarity of statements, competence of direction, and suitability. Additionally, the reliability was determined using a test-retest approach and the computed reliability co-efficient (r) was 0.90 (Nkweke et al., 2012).

Additional survey questions were adopted from a modified version of the Computer Attitude Questionnaire (CAQ) to better understand the students' attitudes towards using the multimedia (Beeland, 2001), which also addressed RQ3. See Appendix D. According to Knezek & Christensen (1996), a preliminary validation study was done using CAQ in 1993 that showed consistent measurement qualities and apparent usefulness. Another study during 1995 validated the construct and criterion-related validity of CAQ and re-validated the psychological constructs through a positive factor analysis (Knezek & Christensen, 1996). The modified version of CAQ includes 20 questions on a 4-point Likert scale of measurement. For this study, questions were

modified to address VoiceThread as the cloud-based multimedia tool. See Appendix E for the adaptation of the two instruments, Multimedia Motivation Questionnaire (MMQ) and Computer Attitude Questionnaire (CAQ), into one survey instrument for this study. The modified version of the combined surveys to address this study included two open-ended questions to determine what students liked most and least about using VoiceThread. It also included a comments section.

Collection of Data

The collection of data was done during the summer 2014 semester. In addressing RQ1, to determine how using the multimedia tool, VoiceThread, affected student achievement in online learning, quantitative data were collected through the six quizzes administered in Angel. The six quizzes were used for the control and treatment groups for weekly folders 2-7. The data collected from the weekly folders 2, 3, and 5 helped determine the statistical equivalence of the control and treatment groups. In addressing RQ2, to determine the difference of opinions and attitudes about the course between students that used the multimedia discussion tool and students that used only text for class discussions, the institution's course evaluation survey using Likert-scale items was administered towards the end of the semester to both control and treatment groups. For this study, items 1, 4, 5, 6, 9, 13, 14, 15, 17, 18, and the comments section of the survey were analyzed. In addressing RQ3, to identify opinions of the technology and its impact, the students in the course section that utilized the multimedia discussion tool, VoiceThread, for class discussions, responded to a survey instrument using Likert-scale items. The Multimedia Motivation Questionnaire (Appendix C) and Computer Attitude Questionnaire (Appendix D) were modified and adopted into one survey (Appendix E)

for this study and were administered online toward the end of the semester to the treatment group after the treatment was completed.

Analysis of Data

Descriptive statistics were used for this study to describe the data and establish the basis of statistical analysis (Fraenkel et al., 2012). Two statistical tests were used for this study: *t* test and multivariate analysis of variance (MANOVA). The *t* test determined if there was a statistical difference between the means of the control and treatment groups. According to Fraenkel et al. (2012), a *t* test is appropriate to compare mean scores of the same group or two matched groups before and after treatment is given to determine if any gain is significant. In addressing RQ1, the *t* test determined whether the students in the treatment group (online discussions that incorporated the multimedia cloud-based discussion tool) performed better than the students in the control group (online discussions with text only). In addressing RQ2, a MANOVA analysis using SPSS 18 was used for the Likert-scale survey items to determine whether there were any differences between the groups for selected items on the institution's course evaluation survey. Fraenkel et al. (2012) described MANOVA as a way to analyze two or more dependent variables that permits a more powerful test of differences among the means and is justified when the researcher believes correlations exist with the dependent variables.

In addressing RQ3, to determine the students' opinions of the technology and its impact in the course section that utilized the multimedia discussion tool, VoiceThread, for class discussions, the mean and standard deviation for each Likert-scale item was calculated. The open-ended question responses were sorted and arranged from the web

survey (Creswell, 2009). The data was read to determine the students' general idea, tone, impression of the overall depth, credibility, and use of the information. The next step was the coding process in order to bring meaning to the information, which included organizing the material into sections of text. The coding process was done to generate a description for categories or themes for analysis. These description and themes were used for a narrative passage to transmit the findings of the analysis. The final step included the interpretation or meaning of the data, which was the researcher's personal interpretation or a comparison of the findings with information gathered from the literature or theories.

Permission was secured from Valdosta State University Institutional Review Board (IRB) to conduct the research. IRB granted an exemption from oversight since this research was conducted in an established or commonly accepted educational setting, involving normal educational practices and involved the collection or study of existing data (see Appendix L).

Chapter IV

FINDINGS

Introduction

The purpose of this study was to determine the students' perceptions of VoiceThread discussion multimedia features' impact on their learning and examine the effects of the multimedia features in VoiceThread discussions on student achievement in online classes. The purpose of this chapter is to present the findings of the statistical analysis of data related to the research questions for this study. This study was guided by the following research questions:

1. How does using the multimedia discussion tool, VoiceThread, affect student achievement in online learning?
2. How are the opinions and attitudes about the BUSN 1440 course different between students that used multimedia and students that used text only for class discussions?
3. In the section of the BUSN 1440 course that utilized the multimedia discussion tool, VoiceThread, for class discussions, what are the opinions of the students about the technology and its impact on the course?

To determine how the multimedia tool, VoiceThread, affected student achievement in online learning, data were collected using a quasi-experimental control group time series research design. A series of six assessments (quizzes) followed early

discussions in weekly folders 2-7 and were administered to the students in the control and treatment groups.

Participant Demographics

There were a total of 56 participants in the study, which excluded students who withdrew from the courses. The control group included 31 students and the treatment group included 25 students. The majority of the students were African-American 71.0% in the control group and 72.0% in the treatment group. The breakdown also showed that White students made up 25.8% of the control group and 28.0% of the treatment group. The remaining students (3.2%) were classified as "Other." The average age for the control group was 34.7 years with a range among the ages of 19 and 63 while the average age for the treatment group was 32.4 years with a range among the ages of 19 and 57. The average number of credits in which students were enrolled was 12.2 for the control group and 12.5 for the treatment group. The average GPA for the control group was 2.4 and 2.6 for the treatment group. The majority of the students were Business Administrative Technology majors (77.4% control group and 84.0% treatment group), with the other majors including Accounting (19.4% control group and 12.0% treatment group) and Medical Assisting (3.2% control group and 4.0% treatment group). Additionally, the majority of the students were female, with 93.5% in the control group and 88.0% in the treatment group. Table 2 indicates the differences in characteristics for the control and treatment groups. Based on these findings, the demographics data showed that the control and treatment groups are very similar.

Table 2

Characteristics of Control and Treatment Groups Compared

	Control Group	Treatment Group
Total count	31	25
Average age	34.7	32.4
Average enrolled credits	12.2	12.5
Average GPA	2.4	2.6
Major		
Business Administrative Technology	24 (77.4%)	21 (84%)
Accounting	6 (19.4%)	3 (12%)
Medical Assisting	1 (3.2%)	1 (4%)
Ethnicity		
African-American or African American	22 (71%)	18 (72%)
White	8 (25.8%)	7 (28%)
Unknown	1 (3.2%)	0 (0%)
Gender		
Female	29 (93.5%)	22 (88%)
Male	2 (6.5%)	3 (12%)

Pre-Analysis Data Screening

Prior to analysis, the data were checked for missing data, normality, and outliers to ensure quality of the study outcomes. There were six assessments (quizzes) total three pre-treatment (assessments 2, 3, and 5) and three post-treatment (assessments 4, 6, and 7). Additionally, two survey instruments were administered (Course Evaluation Survey and Multimedia Questionnaire). The study initially included 62 students (35 in control group and 27 in treatment group); however, 6 withdrew from the course sections leaving a total of 56 students for this study. After the pre-analysis data screening, there were 31 student

records in the control group and 25 in the treatment group included in the data analysis. The total number of participants (control and treatment groups) for this study was an adequate size, given the minimum recommended sample size is 25 per group for *t* test and MANOVA analyses.

Research Question One Results

For this study, the first research question addressed the effects of using the multimedia discussion tool, VoiceThread, for early discussions 4, 6, and 7 in the treatment group to determine the influence they had on student achievement in online learning. Determining the influence of VoiceThread on student achievement in online learning was the main objective of this study.

Research Question 1: How does using the multimedia discussion tool, VoiceThread, affect student achievement in online learning?

A total of six assessments (quizzes) were administered to the students in the control and treatment groups following early discussions. For the control group, all early discussions were completed using text only in the Angel LMS. Early discussions 2, 3, and 5 were completed by the treatment group using text only in the Angel LMS, while 4, 6, and 7 early discussions were completed using the multimedia discussion tool, VoiceThread.

As shown in Table 3, descriptive statistics were run using the explore command in SPSS for each assessment (quiz scores) completed by the control and treatment groups.

Table 3

Descriptive Statistics for Assessment (Quiz) Scores

Groups	*n*	*M*	*SD*
Assessment 2			
Control	31	63.40	25.17
Treatment	25	76.00	21.02
Assessment 3			
Control	31	81.14	33.81
Treatment	25	88.00	21.80
Assessment 4			
Control	31	70.91	31.27
Treatment	25	68.00	29.63
Assessment 5			
Control	31	59.16	34.63
Treatment	25	82.00	28.84
Assessment 6			
Control	31	66.67	36.49
Treatment	25	70.67	27.34
Assessment 7			
Control	31	59.05	40.04
Treatment	25	65.33	35.33

In comparing both the control and treatment groups' assessment scores in Table 3, the scores for assessments 3, 4, 6, and 7 had very little difference. However, assessments 2 and 5 indicated a larger difference in the mean scores. The magnitude of the difference in the mean scores was 13 for assessment 2 in comparison of the control ($M = 63.40$) and treatment ($M = 76.00$) groups and 23 for assessment 5 in comparison of the control ($M = 59.16$) and treatment ($M = 82.00$) groups. Although assessments 2 and 5 had the highest mean scores, they were not part of the treatment. The three assessments (4, 6, and 7) where treatment was applied showed small differences between the means for the control and treatment groups. Also, 5 out of the 6 mean scores of the treatment group (assessments 2, 3, 5, 6, and 7) showed higher than the control group, whether the

treatment was or was not applied. Overall, the findings indicate that there is a small difference in the mean assessment scores and the two groups are comparable.

An independent *t* test was conducted for each assessment. Table 4 shows the independent samples *t*-test results for the pre-treatment and post-treatment assessments.

Table 4

Independent Samples Test for Assessments 2, 3, 4, 5, 6 and 7

	t test for Equality of Means		
	t	*df*	*p* (2-tailed)
Assessment 2	2.00	54	.05
Assessment 3	.88	54	.38
Assessment 4	-.35	54	.72
Assessment 5	2.64	54	.01
Assessment 6	.46	54	.65
Assessment 7	.61	54	.54

In assessing the difference between the control and treatment groups, assessment 2 indicated a statistically significant difference in the mean scores for students in the control group ($M = 63.40$, $SD = 25.17$) and mean score for students in the treatment group ($M = 76.00$, $SD = 21.02$), $t(54) = 2.00$, $p = .05$, two-tailed, $\alpha = .05$). Cohen's effect size suggested that the magnitude of the difference in the means (mean difference = 12.60, 95% *CI:* 25.22 to -00.02) was a moderate positive effect ($d = 0.54$). Assessment 3 indicated that there is not a statistically significant difference in the mean scores for students in the control group ($M = 81.14$, $SD = 33.81$) and means score for students in the treatment group ($M = 88.00$, $SD = 21.79$), $t(54) = .88$, $p = .39$, two-tailed, $\alpha = .05$). Cohen's effect size suggested that the magnitude of the difference in the means (mean

difference = 6.86, 95% *CI:* 22.54 to -08.82) was a small effect *(d* = 0.24). Assessment 4 indicated that there is not a statistically significant difference in the mean score for students in the control group (*M* = 70.91, *SD* = 31.27) and mean score for students in the treatment group (*M* = 68.00, *SD* = 29.63), *t*(54) = -.35, p = .72, two-tailed, α = .05). Cohen's effect size suggested that the magnitude of the difference in the means (mean difference = -2.91, 95% *CI:* 13.55 to -19.38) was a small effect *(d* = 0.10). Assessment 5 indicated a statistically significant difference in the mean scores for students in the control group (*M* = 59.16, *SD* = 34.62) and mean score for students in the treatment group (*M* = 82.00, *SD* = 28.84), *t*(54) = 2.64, p = .01, two-tailed, α = .05). Cohen's effect size suggested that the magnitude of the difference in the means (mean difference = 22.84, 95% *CI:* 40.18 to 5.49) was a moderate to large positive effect *(d* = 0.72). Assessment 6 indicated that there is not a statistically significant difference in the mean scores for students in the control group (*M* = 66.67, *SD* = 36.49) and mean scores for students in the treatment group (*M* = 70.67, *SD* = 27.34), *t*(54) = .46, p = .65, two-tailed, α = .05). Cohen's effect size suggested that the magnitude of the difference in the means (mean difference = 4.00, 95% *CI:* 21.65 to -13.64) was a small effect *(d* = 0.12). Similarly, assessment 7 indicated that there is not a statistically significant difference in the mean scores for students in the control group (*M* = 59.05, *SD* = 40.04) and mean scores for students in the treatment group (*M* = 65.33, *SD* = 35.33), *t*(54) = .61, p = .54, two-tailed, α = .05). Cohen's effect size suggested that the magnitude of the difference in the means (mean difference = 6.28, 95% *CI:* 26.77 to -14.21) was a small effect *(d* = 0.12).

Cohen's effect size suggested that the magnitude of the difference in the means for assessments 3, 4, 6, and 7 was a small effect. Assessment 2 indicated a moderate positive effect while assessment 5 showed a moderate to large positive effect for the magnitude of the difference in the means. Additionally, the assumption of homogeneity of variance was tested using Levene's Test of Equality of Variances. Table 5 shows the results, which includes the *F* statistic and corresponding significance of the *p* value.

The significance level of all the *p* values (.43, .09, .98, .09, .19, and .17) are greater than the established alpha level ($\alpha = .05$) and group variances can be treated as equal. Therefore, the null hypothesis of group variances equal cannot be rejected and each *t* test met the assumption of equal variances.

Table 5

Levene's Test Results for Assessments (Quizzes) 2, 3, 4, 5, 6, and 7

	Levene's Test for Equality of Variances	
	F	*p*
Assessment 2	.65	*.43*
Assessment 3	2.93	*.09*
Assessment 4	.000	*.98*
Assessment 5	2.97	*.09*
Assessment 6	1.78	*.19*
Assessment 7	1.95	*.17*

Based on the analysis of the assessments (quizzes), research question #1 can be answered in determining how the use of the multimedia discussion tool, VoiceThread, affected student achievement in online learning. The analysis of data showed no statistically significant difference in the assessment scores for the control and treatment groups. Although some of the assessment scores were slightly greater in one group than

the other for the treatment assessments, Cohen's effect size suggested that the magnitude of the difference in the means was a small effect.

Research Question Two Results

The second research question for the study addressed the difference of opinions and attitudes about the course between students that used the multimedia discussion tool (treatment group) and students that used text only for class discussions (control group).

Research Question 2: How are the opinions and attitudes about the BUSN 1440 course different between students that used multimedia and students that used text only for class discussions?

The survey instrument used to collect the data (Appendix F) from both control and treatment groups was developed from the institution's course evaluation survey and consisted of 19 questions and a comment section. Items 1, 4, 5, 6, 9, 13, 14, 15, 17, 18, and the comments section were included for this study. The 10 questions used a 5-point Likert-scale of measurement: Strongly Agree 1, Agree 2, No Opinion 3, Disagree 4, Strongly Disagree 5. The comment section was an open-ended section of qualitative input from students to include any additional information that was not addressed in the Likert-scale items.

Fifty-three students from the control and treatment groups completed the survey. During the pre-analysis data screening, it was identified that the control group had 26 responses that included one submission that was blank while the treatment group had 27 responses with two submissions that included one question unanswered. Therefore, there were a total of 50 responses (25 from each group) analyzed. There was also a comment section included in the survey.

A multivariate analysis of variance (MANOVA) test conducted with the two groups included one independent variable and 10 dependent variables. The MANOVA results indicated there was not a statistically significant difference between the treatment and control groups in their opinions and attitudes about the course that were investigated by this survey, F (10, 39) = 1.65, p = .128; Wilk's Λ = 0.703, partial η^2 = .30. The findings from the analysis suggest the opinions and attitudes about the course between students that used the multimedia discussion tool (treatment group) and students that used text only for class discussions (control group) did not show a statistically significant difference. However, the responses from the course evaluation survey show the opinions and attitudes of the students (treatment and control groups) were mostly positive. (See Table 7 for the descriptive results.) Table 6 presents a summary of the multivariate test results.

Table 6

MANOVA Results of Students' Opinions and Attitudes from Course Evaluation Survey

	SS	*df*	*MS*	*F*	*p*	η^2
Q1	.180	1	.180	1.479	.230	.030
Q2	.020	1	.020	.112	.739	.002
Q3	.080	1	.080	.336	.565	.007
Q4	.020	1	.020	.086	.771	.002
Q5	.180	1	.180	.554	.460	.011
Q6	.180	1	.180	.480	.492	.010
Q7	.080	1	.080	.146	.704	.003
Q8	2.000	1	2.000	4.270	.044	.082
Q9	.000	1	.000	.000	1.000	.000
Q10	.080	1	.080	.229	.635	.005
Error						
Q1	5.840	48	.122			
Q2	8.560	48	.178			
Q3	11.440	48	.238			
Q4	11.200	48	.233			
Q5	15.600	48	.325			
Q6	18.000	48	.375			
Q7	26.240	48	.547			
Q8	22.480	48	.468			
Q9	16.880	48	.352			
Q10	16.800	48	.350			

Table 7 shows the descriptive statistics of the course evaluation survey results for students in the control and treatment groups. A 5-point Likert-scale of measurement was used for survey items: Strongly Agree 1, Agree 2, No Opinion 3, Disagree 4, Strongly Disagree 5.

Table 7

Descriptive Statistics for Course Evaluation Survey of Control and Treatment Groups

	Survey Items	*n*	*M*	*SD*
Q1.	The instructor demonstrated a thorough knowledge of the subject matter for this course.			
	Control	25	1.20	0.41
	Treatment	25	1.08	0.28
Q2.	The learning objectives were clearly established for the course.			
	Control	25	1.20	0.41
	Treatment	25	1.24	0.44
Q3.	The class assignments helped me achieve the learning objectives and competencies.			
	Control	25	1.32	0.48
	Treatment	25	1.40	0.50
Q4.	Tests, quizzes and assignments were appropriate to the course objectives and competencies.			
	Control	25	1.36	0.49
	Treatment	25	1.32	0.48
Q5.	The instructor's presentations and explanations were clear and effective.			
	Control	25	1.32	0.48
	Treatment	25	1.44	0.65
Q6.	The instructor used a variety of methods to teach the course objectives and competencies.			
	Control	25	1.36	0.57
	Treatment	25	1.48	0.65
Q7.	The instructor related course material to professional situations.			
	Control	25	1.40	0.58
	Treatment	25	1.48	0.87
Q8	The instructor used the full class period effectively and appropriately.			
.	Control	25	1.28	0.54
	Treatment	25	1.68	0.80
Q9.	The instructor provided feedback on my performance.			
	Control	25	1.32	0.69
	Treatment	25	1.32	0.48

Q10.	The instructor used a variety of assessments to measure my performance and learning.			
	Control	25	1.36	0.70
	Treatment	25	1.28	0.46

Note. A 5-point Likert-scale of measurement was used for survey items: Strongly Agree 1, Agree 2, No Opinion 3, Disagree 4, Strongly Disagree 5.

Based on the descriptive statistics shown in Table 7, the course evaluation survey responses of the control and treatment groups indicate the control group strongly agreed more to Q2, Q3, Q5, Q6, Q7, and Q8 while the treatment group strongly agreed more than the control group for Q1, Q4, and Q10. Both control and treatment groups equally agreed for Q9. The control group had stronger agreement means than the treatment group with 6 out of 10 mean scores being higher in the control group. However, the overall results indicate that the difference between the control and treatment groups is small and both groups responded very positively about the course.

Qualitative data included the comment section of the course evaluation survey instrument used for both groups (control and treatment) as shown in Appendixes G and H. There were not many students (19 out of the 53 responses) in the control and treatment groups who responded in the comment section of the course evaluation survey. However, there were a total of 8 comments from the control group and 11 comments from the treatment group. A content analysis using codes was applied to the comment section of the course evaluation survey. Based on this analysis, categories and themes emerged from the data for this study. Columns were created in the tables to include the comment and code assigned to code and analyze the data. The data was pivoted in Excel to report the summary and analysis of the data.

Two themes emerged from both treatment and control groups in analyzing the course evaluation survey qualitative data. These themes were TC (teacher-related comment) and LE (learning experience). The comments for the control group indicated 57% responded with learning experience comments such as "I have enjoyed this class and learning all the different documents. I will keep my books so that I will always have a reference guide;" "I have learned a lot in this class. It has taught me how to write different letters, setting margins how to enhance a resume, and so on;" "This course has been very educational in my learning about how to use the computer in the medical field." Additionally, 43% responded with teacher comments such as "Mrs. Johnson has taught her class very well. She is very accurate, punctual, and helps each and every one of us with all of our questions and needs in her class;" "I enjoyed having Mrs. Johnson as my instructor this semester and am looking forward to having her as my instructor next semester as well. I have experienced the capabilities of achieving tasks at a higher level with Mrs. Johnson."

The comments for the treatment group indicated 91% responded with teacher-related comments such as "I learned through the instructor's teaching measures. I loved that the instructor was quick to reply to my questions and also kept me as a student encouraged to do my best;" "Ms. Kayano Bell is a very helpful and understanding instructor. She was there to respond to my emails day, night, weekday or the weekends. I really have enjoyed her as an online instructor. She is a very professional woman and if I have any other subject to take, and she is the instructor, I would definitely enroll in her class. Why? I know I will be instructed correctly and learn the material at hand;" "She has truly been one of the best instructors I have had this far! I would highly recommend

her to anyone in need of this class, and I look forward to more in the future;" "Ms. Bell has truly been a great instructor and goes out her way to make sure you understand your work." and 9% responded with learning experience comments such as "Heavy workload!" The comments for the control group are shown in Appendix G and the treatment group comments are shown in Appendix H. Overall, the nature of the comments were very positive for both the control and treatment groups. It was noted that the control group comments were more about the learning experience (57%) while the treatment group comments were more teacher-related (91%).

Research Question Three Results

The third research question of the study addressed students' opinions of the technology and its impact on the course section that utilized the multimedia discussion tool for class discussions.

Research Question 3: In the section of the BUSN 1440 course that utilized the multimedia discussion tool, VoiceThread, for class discussions, what are the opinions of the students about the technology and its impact on the course?

The survey instrument used to collect the data (Appendix E) from the treatment group was adopted from the Multimedia Motivation Questionnaire (Appendix C) and Computer Attitude Questionnaire (Appendix D) into one survey instrument for this study. The modified version of the combined survey to address this research included 29 Likert-response items, two open-ended questions to determine what students liked most and least about using VoiceThread, and a comment section to include any additional information that was not addressed in the other items. The 29 Likert-type response items used a 4-point scale of measurement: 4 points-Strongly Agree, 3 points-Agree, 2 points-

Disagree, and 1 point-Strongly Disagree. The items were also modified to address VoiceThread as the multimedia cloud-based discussion tool and the subject area course as Document Production.

Although the treatment group consisted of 25 students, 23 students completed the multimedia survey. However, the final number of respondents was 22, with one being a blank response which was not included for analysis. Additionally, Q2 and Q21 showed 21 responses rather than 22. Table 8 shows the descriptive statistics of the multimedia survey results for students in the treatment group with the mean value ordered highest to lowest.

Table 8

Descriptive Statistics for Multimedia Survey of Treatment Group

	Survey Items	*n*	*M*	*SD*
Q2.	Considering individual differences in learners, teachers' use of combination of instructional media in VoiceThread such as audio, video, images, and text can cater to students' learning styles when learning new information.	21	3.52	0.68
Q4.	When teachers use two or more different types of media such as audio, video, images, and text during online discussions, it helps to facilitate my understanding of new information.	22	3.45	0.86
Q20.	I feel comfortable using VoiceThread.	22	3.41	0.96
Q1.	VoiceThread, if used in teaching, can motivate my interest in learning about the various technologies in the Document Production course.	22	3.41	0.91
Q19.	I believe that it is important for me to learn how to use VoiceThread.	22	3.41	0.73
Q15.	I know that using VoiceThread gives me opportunities to learn many new things.	22	3.36	0.85
Q21.	I enjoy using VoiceThread.	21	3.33	0.91
Q23.	Using VoiceThread does not scare me at all.	22	3.32	0.95
Q10.	I enjoy learning with VoiceThread.	22	3.32	0.84
Q5.	The use of multimedia devices like VoiceThread with its combination of two or more types of media such as audio, video, images and text can aid recall and retention in students.	22	3.32	0.78
Q17.	I enjoy completing online discussions using VoiceThread.	22	3.27	0.99

Q9.	I prefer that my teacher use VoiceThread to the old traditional discussion method, when presenting new information in Document Production.	22	3.23	0.92
Q18.	I believe that the more often teachers use VoiceThread, the more I will enjoy online classes.	22	3.23	0.92
Q16.	I can learn many things when my teacher uses VoiceThread.	22	3.23	0.81
Q13.	I concentrate better when VoiceThread is used for online discussions.	22	3.14	0.94
Q12.	I will be able to get a better understanding about the online discussions if I learn how to use VoiceThread.	22	3.14	0.77
Q14.	I would work harder if my teacher used VoiceThread more often.	22	2.95	0.95
Q3.	When teachers use the old traditional teaching method (i.e. discussion posts with text only), it hardly motivate my interest to learn about the various technologies in Document Production.	22	2.68	1.00
Q28.	I can learn more from traditional online discussions (text only) than VoiceThread.	22	2.50	1.10
Q8.	I feel motivated to learn whenever the teacher does not combine or use different types of instructional media (audio, video, images, and text).	22	2.45	1.18
Q25.	Using VoiceThread is very frustrating.	22	2.36	1.14
Q11.	I do not like receiving instruction through VoiceThread when completing online discussions.	22	2.32	1.25
Q22.	I think it takes a longer amount of time to learn when my teacher uses VoiceThread.	22	2.27	1.16
Q6.	Using VoiceThread in teaching Document Production cannot support and motivate students' interest to learn the subject.	22	2.23	1.19
Q24.	Using VoiceThread makes me nervous.	22	2.23	1.11
Q27.	VoiceThread is difficult to use.	22	2.18	1.10
Q29.	I get a sinking feeling when I think of trying to use VoiceThread.	22	2.14	1.12
Q7.	Combination of two or more media such as audio, video, images, and text in teaching Document Production cannot enhance students' understanding of various technologies.	22	2.14	1.08
Q26.	I will do as little work with VoiceThread as possible.	22	2.14	1.04

Note. A 4-point Likert-scale of measurement was used for the survey items: 4 points- Strongly Agree, 3 points- Agree, 2 points- Disagree, and 1 point- Strongly Disagree.

Levels were established based on the mean scores for the descriptive statistics results. Level 1 (3.52- 3.41) identified responses that relate to positive motivation and self-efficacy, Level 2 (3.36- 3.32) positive feelings, Level 3 (3.27- 3.14) good learning experience, Level 4 (2.95- 2.45) teaching method, and Level 5 (2.36- 2.14) apprehensive

or negative feelings. A content analysis was done based on the levels. The analysis reported 31% of the items addressed level 5 such as "I get a sinking feeling when I think of trying to use VoiceThread;" "VoiceThread is difficult to use;" "Using VoiceThread is very frustrating;" "I will do as little work with VoiceThread as possible." Level 3 showed 21% of the items such as "I enjoy completing online discussions using VoiceThread;" "I believe that the more often teachers use VoiceThread, the more I will enjoy online classes;" "I concentrate better when VoiceThread is used for online discussions." Level 1 included 17% of items like "VoiceThread, if used in teaching, can motivate my interest in learning about the various technologies in the Document Production course;" "When teachers use two or more different types of media such as audio, video, images, and text during online discussions, it helps to facilitate my understanding of new information." Level 2 also included 17% of items such as "I enjoy learning with VoiceThread;" "Using VoiceThread does not scare me at all;" "I know that using VoiceThread gives me opportunities to learn many new things." Level 4 showed 14% of the items like "I would work harder if my teacher used VoiceThread more often;" "When teachers use the old traditional teaching method (i.e., discussion posts with text only), it hardly motivate my interest to learn about the various technologies in Document Production.

Overall, the usage of the multimedia tool, VoiceThread, for class discussions was a positive experience for students. Many of the students reported that the use of combination of instructional media in VoiceThread can cater to students' learning styles when learning new information ($M = 3.52$), and when teachers used two or more different types of media during online discussions, it helped to facilitate a better understanding of new information ($M = 3.45$). Item 20 showed that most students felt comfortable using

the multimedia tool (M = 3.41). The students also felt that VoiceThread could motivate their interest in learning about the various technologies in the course (M = 3.41), they enjoyed using VoiceThread (M = 3.33), and felt that VoiceThread could aid in recall and retention (M = 3.32). Item 23 ("Using VoiceThread does not scare me at all") responses indicated that the multimedia tool did not make the students scared (M = 3.32). Students believe that the more often teachers use VoiceThread, the more they will enjoy online classes (M = 3.23). The responses did not indicate major issues in using VoiceThread. Other responses ("Using VoiceThread is very frustrating," "Using VoiceThread makes me nervous") indicated that the students did not become frustrated (M = 2.36) or nervous (M = 2.23) when using the multimedia tool. Additionally, item 27 ("VoiceThread is difficult to use") showed that most students reported VoiceThread was not difficult to use (M = 2.18). Furthermore, item 7 ("Combination of two or more media such as audio, video, images, and text in teaching Document Production cannot enhance students' understanding of various technologies") reported 39.1% of the students disagreed and 30.4% students strongly disagreed, which indicated the majority of the students thought a combination of two or more media in teaching Document Production could enhance their understanding of various technologies (M = 2.14).

There were also open-ended questions and a comment section of the Multimedia Questionnaire (Q30, Q31, and comment section) that students completed. The data were reviewed by identifying any themes, categories, patterns, and relationships, then organized in tables and sorted by question for analysis. Codes were developed for each question based on categories and themes that emerged from the data and predefined codes that were anticipated for this study. Columns were created in the tables to include

the question number, responses, and code assigned to code and analyze the data by question. The data was pivoted in Excel to report the summary and analysis of the data.

There were 20 responses completed by the students for Question 30, "What did you like best about using VoiceThread," and are shown in Appendix I. Themes were developed in analyzing the qualitative data that included five codes MM (multimedia), VF (VoiceThread features), AW (new/alternative way to communicate), UF (user-friendly), and NA (nothing or n/a). The analysis reported 35% liked the multimedia best, such as "I like the visual and audio presentation to explain the assignment. The teaching was just like I was sitting in a classroom;" "Sometimes when you hear and see things you get a better understanding;" "What I liked best was that I didn't have to type all those words in my thoughts I can just say what came to mind according to my work." The analysis reported 30% liked VoiceThread features best, for instance "I liked the idea of being able to communicate with my classmates and instructors and be able to see their pics on their profiles. I like putting a face with who I'm communicating with;" "I like everything about Voice Thread especially being able to see and hear my professor and classmates. Voice Thread made the class not feel like an online class. I really wish we used Voice Thread more often." The analysis reported 15% liked best that the tool was user-friendly, such as "Voicethread was very easy to understand, and it guides you through the assignment a whole lot better;" "Voicethread was very helpful to me. I would say it is easier to complete the discussions." The analysis reported 10% liked a new/alternative way to communicate best, such as "What I liked best about using Voice Thread was the fact that I was introduced to a new way of communication through technology. I was really infatuated and encouraged to use it more;" "I liked having an

alternative to learn and interact with fellow classmates." The analysis reported 10% responded to the theme nothing or n/a, "nothing."

Question 31 "What did you like least about using VoiceThread" also had 20 responses as shown in Appendix J. Themes were developed in analyzing the qualitative data that included four codes TI (technical issues), NI (no issues, nothing, or n/a), AF (using additional features other than text only), and DL (did not like tool). The analysis reported 70% had no issues using VoiceThread, for instance "Nothing. I liked everything about it," "I like everything about VoiceThread;" "Nothing. Everything seems great." The analysis reported 15% commented on technical issues, such as "When it had a popup that said I needed to spend 10 dollars in order to use it during class time;" "I got confused getting logged in." The analysis reported 10% commented on additional features other than text only, such as "Having to record my voice or show a picture;" "I did not like the way that the search key was not directing me to the lesson." One respondent reported not liking the tool: "I don't find it very useful in this class."

There were only 8 student responses out of the 22 final responses for the comment section. The comments developed from the students' experience in using VoiceThread and were mostly positive in nature. Most of the comments, which centralized on one theme in using VoiceThread, indicated the students had a good experience. The following are the comments to support the theme:

1. "I would like to use again."
2. "I really enjoy it and hope more teachers incorporate it in the future."
3. "Thanks for giving me another way of communicating. I really like the technology."

4. "I am still excited about how the teaching was made simple and easy for me to learn."
5. "I think VoiceThread can be good."
6. "Great program!"

Additionally, themes were developed in analyzing the data for the comment section of the multimedia questionnaire. A total of four codes were included TC (teacher-related comment), ND (no difference from other teaching methods or not preferred), EV (enjoyed/liked using VoiceThread), and LI (liked VoiceThread but had issues using it). The analysis reported 50% enjoyed/liked using VoiceThread, such as "I really enjoy it and hope more teachers incorporate it in the future." The analysis reported 25% commented that VoiceThread was no different than other teaching methods or did not prefer it, for instance "Other than that VoiceThread is ok, there's really no different than the regular teaching technique." The analysis reported one respondent liked VoiceThread but had issues using it: "I think VoiceThread can be good, but I have a difficult time with all the different logins Angel, GDP, email and then VoiceThread." Another student responded with teacher comments: "I am excited still about Ms. Kayano Bell and her teaching. She made it simple and easy for me to learn and did not hesitate to email back within a day or the same day to answer my questions. She made sure grades were posted on time each week and it gave me a sense of confident that I could really do this! Thank you Ms. Bell for allowing me to be your student this summer and I hope to have you next semester." Themes were also the same from other qualitative data such as teacher-related comments and the enjoyment of using VoiceThread.

Results Summary

The overall findings for this study indicated no statistically significant difference between the treatment and control groups' learning. Six assessments (pre-treatment and post-treatment) were administered to the students in the control and treatment groups to determine if using the multimedia discussion tool, VoiceThread, affected student achievement in online learning. The analysis of data showed no statistically significant difference in the assessment scores for the control and treatment groups. Some of the assessment scores were slightly greater in one group than the other; however, Cohen's effect size suggested that the magnitude of the difference in the means was mostly a small effect. Additionally, two survey instruments were administered, the course evaluation survey and the multimedia questionnaire. The course evaluation survey addressed the difference of opinions and attitudes about the course between control and treatment groups. The findings did not show a statistically significant difference. However, the overall responses from the course evaluation survey did show mostly positive responses from students in the treatment and control groups. The multimedia questionnaire was administered to gain the opinions of the students in the treatment group about the technology and its impact on the course. The multimedia questionnaire responses indicated the usage of the multimedia tool, VoiceThread, was nearly all positive for the students in the treatment group.

Chapter V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Introduction

The purpose of this study was to determine the students' perception of VoiceThread discussion multimedia features' impact on their learning and examine the effects of the multimedia features in VoiceThread discussions on student achievement in online classes.

The following research questions guided this study:

1. How does using the multimedia discussion tool, VoiceThread, affect student achievement in online learning?
2. How are the opinions and attitudes about the BUSN 1440 course different between students that used multimedia and students that used text only for class discussions?
3. In the section of the BUSN 1440 course that utilized the multimedia discussion tool, VoiceThread, for class discussions, what are the opinions of the students about the technology and its impact on the course?

Overview of the Study

Over time, literature has shown no difference in student achievement of online and traditional college courses and how there was a difference when comparing online versus traditional face-to-face environment (Dillon, Dworkin, Gengler, & Olson, 2008). However, recent studies have shown how students have performed equally as well in

online versus face-to-face courses even with some students having challenges in online courses (Baxter & Kirpalani, 2012). Based on an operational report at Albany Technical College, student performance in Business Administrative Technology online classes had been consistently low. Albany Technical College provided the Operational Report FY 2012 to include overall course averages for summer 2011, fall 2011, and spring 2012. The report indicated 6 out of 7 BUSN 1440 Document Production courses in the Business Administrative Technology area that were taught online were below 70% percentile while the other four BUSN 1440 taught face-to-face were above the 70% percentile. Based on the instructors' observation and perception, there was a need to include more interactive and engaging instruction such as creative discussions (Albany Technical College, 2012).

A pilot study was done in fall 2012 to implement cloud-based discussions using VoiceThread in an online section of BUSN 1440 to help increase student interaction. It was uncertain to what degree the instructional strategy impacted students' involvement in the course; however, the overall course average was above 70% percentile. The instructional strategy was also implemented in spring 2013, summer 2013, and fall 2013 and all overall course averages except for spring 2013 were above 70% percentile.

Description of Population

The population for this study was 56 students, excluding students that withdrew from the courses. The control group consisted of 31 students. The demographics section provided general information such as age, enrolled credits, GPA, major, ethnicity, and gender. The results showed that students in both the control and treatment groups were very similar. The control group ranged among the ages of 19 and 63 with the average age

of 34.7. Most of the students were enrolled in 12 credit hours (29%) and 14 credit hours (25.8%). The GPA ranged from 1.07 to 3.66. There were three different program majors represented that included Accounting (19.4%), Business Administrative Technology (77.4%), and Medical Assisting (3.2%). The majority of the students' ethnicity were African American (71%) while the remaining were White (25.8%) and other (3.2%). The analysis also indicated that 29 of the students were female (93.5%) and 2 were male (6.5%).

The treatment group consisted of 25 students. The results showed that the students ranged among the ages of 19 and 57 with the average age of 32.4. Majority of the students were enrolled in 13 credit hours (32%) and 12 credit hours (20%). The GPA ranged from .56 to 4.00. Students were enrolled in the same three program majors as the control group: Accounting (12%), Business Administrative Technology (84%), and Medical Assisting (4%). The majority of the students' ethnicity were African American (72%) and the remaining were White (28%). The breakdown for the treatment group also indicated that 22 of the students were female (88%) students and 3 were male (12%).

Procedures

This study employed a quasi-experimental control group time series research design to determine if a specific treatment influenced student learning. Two groups were compared (control and treatment) during the period of summer semester 2014 both before and after the treatment. The control and treatment groups included students enrolled in two online and two face-to-face sections of BUSN 1440 Document Production. The control group consisted of 31 students and 25 for the treatment group.

The control and treatment groups used the same projected learning schedule in completing 7 weekly lesson folders; however, folders 2-7 were used for this study to promote a better understanding of the content covered during those weeks. The weekly folders consisted of an early online discussion, a set of weekly unit assignments, and a quiz (assessment). The control group's online discussions for weekly folders 2-7 were facilitated in the Angel LMS using text only text. The treatment group included online discussions for the same weekly folders; however, weekly folders 2, 3, and 5 were facilitated in the Angel LMS using text only while weekly folders 4, 6, and 7, which included more complex content, were facilitated using, VoiceThread, the multimedia cloud-based discussion tool. A weekly quiz was administered to both groups to test understanding of concepts and task related skills using the Angel LMS after the online discussion and weekly unit assignments had been completed for each folder (weekly folders 2-7). The demographics data was retrieved from the Information Technology department at Albany Technical College as a report that included student data for age, enrolled credits, GPA, major, ethnicity, and gender of the students in the control and treatment groups. The quantitative data to determine how VoiceThread affected student achievement was collected through the six assessments (quizzes) administered in the Angel LMS for weekly folders 2-7 and a *t* test was administered to determine if there was a statistical difference between the means of the control and treatment groups. A multivariate analysis of variance (MANOVA) was administered using data collected from selected items on the institution's course evaluation survey to determine the difference of opinions and attitudes about the course between students in the control and treatment groups. A descriptive statistics test was conducted using the data collected from

two survey instruments, Multimedia Motivation Questionnaire (Appendix C) and Computer Attitude Questionnaire (Appendix D), that were modified and adopted into one survey (Appendix E) to determine the opinions of the technology and its impact on students in the treatment group. Open-ended questions were also included to collect student opinions of the treatment and the course itself.

Conclusions

Based on the findings, I derived the following four conclusions:

1. Since there was no difference between the treatment and control groups, achievement was comparable between the two groups.
2. The multimedia tool's influence on student achievement leveled the achievement between the two groups. It could be suggested that the multimedia tool, VoiceThread, did have an impact on student achievement and student learning in comparison to the previous data provided from the Operational Report FY 2012.
3. The opinions and attitudes of the course were positively impacted by the multimedia tool. The responses and comments of both surveys, course evaluation survey and multimedia questionnaire, were mostly positive in nature.
4. Online and traditional face-to-face courses are more comparable in student achievement and online learning and it emerges from the recent literature.

Discussion

For this study, three major themes were highlighted from the review of literature: multimedia usage, VoiceThread, and online versus traditional face-to-face formats. Recent studies have shown that exploration of media is one of the most important trends today, especially for educators and the increasing growth of online. In 2012, a study

examined how educators learned to design multimodal responses based on a course assignment that implemented Glogster, a virtual poster with multimedia components (Karchmer-Klein & Shinas, 2012). The findings showed that Glogster did influence the multimodal electronic text created by the participants. The majority of research on VoiceThread is based on K-12 education rather than higher education, which identified a gap in literature for this study. Recent studies have examined student experiences with the usage of VoiceThread and have shown how it has supported learners through meaningful and engaging activities. However, many of the studies focused on K-12 education and included topics such as early childhood mathematics (virtual collaboration), middle school language arts (writing, illustration, and poetry), and common core standards (multimodal text responses). In 2013, a study was conducted at Northwestern State University to evaluate the perception of the students for collaboration and knowledge sharing using VoiceThread in comparison to text-based discussions (Yu-Hui & Yu-Chang, 2013). The findings showed that students had positive experiences toward using VoiceThread for collaborative learning and about half preferred VoiceThread over the text-based option. Although the study was conducted at a university, most of the participants were K-12 educators. Moreover, recent studies have shown how online and traditional face-to-face courses are more comparable in student achievement and student learning. In 2014, a study was conducted to compare performances and preferences of students in online and traditional face-to-face sections of an immunization elective course (Porter, Pitterle, & Hayney). The findings indicated no statistically significant difference in the final grades of the two groups and most of the students in the online section (68%) reported they would take another online course.

The results of the first research question revealed no statistically significant difference between the control and treatment group assessment scores. There was a small difference in the mean assessment scores and the two groups were comparable. Cohen's effect size also suggested that the magnitude of the difference in the means was a small effect. Overall, the achievement levels of the two groups were comparable. However, assessments 2 and 5 indicated a larger difference in the mean scores for the treatment group but were not part of the treatment.

To help understand the differences in the results of the assessments, as cited in Chapter 1, the students in the online and face-to-face courses did not perform comparably based on the Operational Report FY 2012. The report indicated that eleven BUSN 1440 courses were assessed over three terms with an overall performance of 68.18%. The report findings showed the online environment was below the 70% percentile with online averages of 71, 61, 68, 55, 67, 65, and 55, with a general mean of 63.1%, while traditional classroom (face-to-face format) averages were 72, 78, 74, and 87, with a general mean of 77.75%. In comparing the percentile of the treatment group for this study with the previous online sections from the operational report, the percentile of the treatment group (76%) exceeded percentiles of all previous online sections noted in the operational report. It can be observed that the multimedia tool, VoiceThread, may have improved online student achievement as compared to previous online student achievement for BUSN 1440 courses included in the Operational Report FY 2012. However, limitations of the treatment circumstances should be recognized that included a small number (25) in the treatment group, one online section during the summer semester as the treatment group, percentage (20%) of the discussion grade leading to the overall

course grade, and maybe not as much student participation in discussions due to the low percentage allotted for discussion that contributed to the overall course grade. Because of these limitations, it cannot be said with strong confidence that VoiceThread made a difference but it is interesting to know the difference in the operational report and the treatment group. An unexpected finding was the higher mean scores in assessments 2 and 5 for the treatment group, which could relate to learner preferences or conditions in the face-to-face environment. Some of the students in the treatment group may have preferred no media (text only) for discussions, and as a result, performed better in completing assessments 2 and 5. This is later noted in the results of research question three based on a comment of what students liked least about VoiceThread, "Having to record my voice or show a picture." In contrast, the control group could have experienced certain conditions in the environment during assessments 2 and 5 that may have contributed to lower mean scores.

The results for the second research question showed that the differences between the control and treatment groups were small. The control group had stronger agreement means than the treatment group (6 out of 10 items) but both groups responded very positively about the course. The qualitative data in the comment section of the course evaluation survey also showed the nature of the comments were very positive for both the control and treatment groups. It was noted that students in the treatment group did not comment any about the multimedia tool in the comment section of the course evaluation survey. Also, the control group comments were more about the learning experience (57%) while the treatment group comments were more teacher-related (91%). It could be observed that maybe the students' previous online experiences did not include the same

humanized presence such as multimedia (pictures, videos, and audio messages) to better connect with the instructor and peers based on comments such as "I really have enjoyed her as an online instructor;" "I learned through the instructor's teaching measures;" "She makes you feel welcomed and comfortable;" "Ms. Bell has truly been a great instructor and goes out her way to make sure you understand your work;" "I feel that Mrs. Bell is one of the best instructors that I have ever had." The observation and comments aligned with the understanding of the conceptual framework for this study. The Cognitive of Multimedia Theory supports learning can be more successful by presenting instructional materials in multiple modes such as auditory and visual for learners to process information.

The results for the third research question showed that the usage of the multimedia tool, VoiceThread, for class discussions was a positive experience for students. Two open-ended questions were included in the multimedia questionnaire to determine the opinions about the best and least liked features of VoiceThread. Themes were developed in analyzing the qualitative data. The theme "multimedia" was ranked as the best liked feature (35%) and "nothing" was ranked highest for the least liked feature (70%) because most students commented as having no issues. The responses were mostly positive in nature. The comment section of the survey centralized one theme in using VoiceThread. Most of the comments were positive and favored the usage of the multimedia tool.

Overall, the usage of the multimedia tool, VoiceThread, for class discussions was a positive experience for students. The control and treatment groups were comparable with the mean scores although the assessments did not show a statistically significant

difference between the two groups. The course evaluation survey overall results indicated that the difference between the control and treatment groups was small and both groups responded very positively about the course. Additionally, the usage of the multimedia tool, VoiceThread, for class discussions was a positive experience, for students based on the responses from the multimedia questionnaire. The findings for this study indicate that online learning is comparable to face-to-face learning, and it also relates to recent studies emerging from the literature. In conclusion, the control and treatment groups were comparable in achievement, attitude, and opinion in the effectiveness of the course.

Limitations

This study used convenience sampling, which excludes a true experimental design with random sampling and limits the generalizability of the findings for this study. The small sample size as well as the short timeframe limits the generalizability of the study's results. There were a total of 56 participants for this study. The study was completed in summer 2014, which consisted of 10 weeks, rather than the average semester of 16 weeks which limits student opportunity to engage and reflect on the multimedia tool.

Recommendations

Recommendations for Practice

1. It is recommended that other online courses offered by the institution consider the tool in an effort to help increase student achievement in the online environment. Many comments from the multimedia questionnaire included students enjoying the usage of VoiceThread and some students would like to use in other courses. As mentioned in a student's comment, "I really enjoy it and hope more teachers incorporate it in the future."

Attention should be given to the type of online course for VoiceThread implementation. The course for this study, BUSN 1440 Document Production, was highly procedural versus other classes that may be more theoretical. Such examination may show that VoiceThread may be more influential depending on the type of class. Implementation of VoiceThread in BAT courses seemed to have increased student interaction and teacher presence. Therefore, it is recommended that VoiceThread be implemented to improve student-student and student-teacher interactions.

2. Based on some of the responses from the multimedia questionnaire about technical issues, it is recommended that the multimedia tool be introduced (introduction assignment) to students prior to early discussions to help familiarize students in using the tool prior to being graded. Also, it is recommended to consider an online orientation to demonstrate detailed steps of the process in using the multimedia tool, VoiceThread, rather than Web links to access documentation and videos for instruction. This will help eliminate uncertainty, nervousness, and frustration of the students using the multimedia tool.
3. It is recommended that an online readiness assessment or survey should be provided for students enrolled in the course (prior to the start of the semester) to determine online experience and technology levels of the students. This will assist in preparing students for the online course as well as using the multimedia tool. This may also reveal a better understanding of the multimedia questionnaire responses from the question that addressed the least liked features and dislike of the multimedia tool.

Recommendations for Research

1. Future study should be conducted using the multimedia tool, VoiceThread, for the entire class of discussions (early discussions 1-7) and compare class grades to previous online BUSN 1440 class grades.
2. This study was conducted with the control group including one online section and two face-to-face sections of the BUSN 1440 course, while the treatment group consisted of one online section. Future study should be conducted of distinguished groups (control and treatment) that look at face-to-face versus online rather than the control group including face-to-face and online sections.
3. This study was conducted with a small sample size of 56 participants. It is recommended to conduct further study with the same design but a larger number of participants to determine the impact of the multimedia tool, VoiceThread.
4. It is recommended to conduct this study with a semester that consist of 16 weeks rather than 10 weeks. It is also recommended to conduct the study over more than one semester.
5. It is further recommended that research be conducted to investigate the relationship between the students' learning styles and multimedia. Based on the findings of this study, it could better assist in addressing the individual needs of students and increase student achievement in the online environment.

Overall, the findings for this study indicated no statistical significant difference among the treatment and control groups. However, the control and treatment groups were comparable in achievement, attitude, and opinion in the effectiveness of the course. An unexpected finding of the higher mean scores in assessments 2 and 5 for the treatment

group could have implied that some students preferred text only for discussions rather than media. In contrast, it may have also suggested that the control group experienced certain conditions in the environment during assessments 2 and 5 that could have contributed to lower mean scores. Another unexpected finding was that students in the treatment group did not comment any about the multimedia tool in the comment section of the course evaluation survey. Additionally, the control group comments were more about the learning experience (57%) while the treatment group comments were more teacher-related (91%). Based on some of the comments from the multimedia questionnaire, it could be suggested that the students' previous online experiences did not include the same humanized presence such as multimedia (pictures, videos, and audio messages) to promote a connection with the instructor, peers, and environment. It could also be suggested that the multimedia tool, VoiceThread, did have an influence on student achievement and student learning in comparison to the previous data provided from the Operational Report FY 2012.

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APPENDIX A:

Online Discussion Questions

APPENDIX A

ONLINE DISCUSSION QUESTIONS

Folder 1- Online Discussion #1
What is the difference between a business letter formatted in block style and a business letter formatted in modified block style? Be sure and refer to the reference manual pages at the beginning of your textbook.

Folder 2- Online Discussion #2
What is a resume and what information is typically included in a resume?

Folder 3- Online Discussion #3
What are some specific formatting guidelines you could identify for typing an agenda? There are 6 typical sections to Minutes of a Meeting. Identify any 4 of those 6 sections.

Folder 4- Online Discussion #4
Define a boxed table. Discuss all the formatting decisions you would have to make when typing a table title and subtitle.

Folder 5- Online Discussion #5
What is a dot-leader tab and where would you most likely use a dot-leader tab in a report?

Folder 6- Online Discussion #6
When creating a Last Will and Testament legal document, what are some particular callouts in the margin and language arts rules that are applied to the document?

Folder 7- Online Discussion #7
When designing announcements and flyers, what are the steps to change the text wrapping style on a picture in order to move the graphic freely on the page? What are the steps to apply border to the text box?

APPENDIX B:

Sample Weekly Quiz

APPENDIX B

SAMPLE WEEKLY QUIZ

1. You should type your own reference initials in lowercase (no periods or spaces) in black whenever you see urs in letters or memos.
- ◯ A) True
- ◯ B) False

2. In an open table, no borders or rules are displayed.
- ◯ A) True
- ◯ B) False

3. Arrange the order of the four headings typically included in a memo.
- ▾ A) Subject
- ▾ B) From
- ▾ C) Date
- ▾ D) Memo To

4. The ¶ (in red) symbol indicates a new, blocked _____.
- ☐ A) line
- ☐ B) table
- ☐ C) word
- ☐ D) paragraph
- ☐ E) letter

5. In a _____ block style letter the date and closing lines begin at the midpoint of the writing line.
- ◯ A) memo
- ◯ B) modified
- ◯ C) simplified
- ◯ D) personal
- ◯ E) executive

6. A table title must be typed in Row 1, centered horizontally in the row, and must be typed in bold and all caps.
- ◯ A) True
- ◯ B) False

7. In a business report, the body of the report is double-spaced, with single-spacing between individual paragraphs.
- ◯ A) True
- ◯ B) False

8. Use a _____ between each item in a series of three or more.
- ☐ A) comma
- ☐ B) hyphen
- ☐ C) period
- ☐ D) heading
- ☐ E) quoatation

APPENDIX C:

Multimedia Motivation Questionnaire

APPENDIX C

MULTIMEDIA MOTIVATION QUESTIONNAIRE

S/n.	Item
1	VCD, if used in teaching, can motivate your interest in learning Biology
2	Considering individual differences in learners, teachers' use of MM instructional devices or combination of varieties of instructional media can cater for students learning styles during lesson
3	When teachers use the old traditional teaching method (i.e. use of chalk-talk), it hardly motivate your interest to learn biology
4	When teachers use two or more different types of media during lesson presentation, it helps to facilitate your understanding of the lesson
5	The use of multimedia device like VCD or the combination of two or more types of media can aid recall and retention in students
6	Using VCD in teaching biology cannot support and motivate students interest to learning the subject
7	Combination of two or more media in teaching biology cannot enhance students understanding of biology
8	You feel motivated to learn whenever the English teacher does not combine or use different types of instructional media
9	When your biology teacher do not use reward and combination of different instructional media in teaching, you feel motivated to learn
10	You prefer your teacher using VCD or computer power point to the old traditional chalk-talk method of teaching, when presenting lessons on biology

APPENDIX D:

Computer Attitude Questionnaire (modified version)

APPENDIX D

COMPUTER ATTITUDE QUESTIONNAIRE (modified version)

Question

1. I enjoy learning with a whiteboard.
2. I do not (do) like receiving instruction through a whiteboard.
3. I will be able to get a good job if I learn how to use technology.
4. I concentrate better in class when a whiteboard is used to deliver instruction.
5. I would work harder if my teacher used the whiteboard more often.
6. I know that using technology gives me opportunities to learn many new things.
7. I can learn many things when my teacher uses a whiteboard.
8. I enjoy lessons on the whiteboard.
9. I believe that the more often teachers use whiteboards, the more I will enjoy school.
10. I believe that it is important for me to learn how to use a whiteboard.
11. I feel comfortable using a whiteboard.
12. I enjoy using the whiteboard.
13. I (do not) think that it takes a longer amount of time to learn when my teacher uses a whiteboard.
14. Using a whiteboard does not scare me at all.
15. Using a whiteboard (does not make) makes me nervous.
16. Using a whiteboard is (not) very frustrating.
17. I will (not) do as little work with technology as possible.
18. Whiteboards are (not) difficult to use.
19. I can (not) learn more from books that the whiteboard.
20. I (do not) get a sinking feeling when I think of trying to use a whiteboard.

APPENDIX E:

Multimedia Motivation Questionnaire and Computer Attitude Questionnaire (modified versions)

APPENDIX E

MULTIMEDIA MOTIVATION QUESTIONNAIRE

AND

COMPUTER ATTITUDE QUESTIONNAIRE

(modified versions)

#	Question	Strongly Agree 4	Agree 3	Disagree 2	Strongly Disagree 1
1	VoiceThread, if used in teaching, can motivate my interest in learning about the various technologies in the Document Production course.				
2	Considering individual differences in learners, teachers' use of combination of instructional media in VoiceThread such as audio, video, images, and text can cater to students' learning styles when learning new information.				
3	When teachers use the old traditional teaching method (i.e. discussion posts with text only), it hardly motivate my interest to learn about the various technologies in Document Production.				
4	When teachers use two or more different types of media such as audio, video, images, and text during online discussions, it helps to facilitate my understanding of new information.				
5	The use of multimedia devices like VoiceThread with its combination of two or more types of media such as audio, video, images and text can aid recall and retention in students.				
6	Using VoiceThread in teaching Document Production cannot support and motivate students' interest to learn the subject.				
7	Combination of two or more media such as audio, video, images, and text in teaching				

	Document Production cannot enhance students' understanding of various technologies.				
8	I feel motivated to learn whenever the teacher does not combine or use different types of instructional media (audio, video, images, and text).				
9	I prefer that my teacher use VoiceThread to the old traditional discussion method, when presenting new information in Document Production.				
10	I enjoy learning with VoiceThread.				
11	I do not like receiving instruction through VoiceThread when completing online discussions. .				
12	I will be able to get a better understanding about the online discussions if I learn how to use VoiceThread.				
13	I concentrate better when VoiceThread is used for online discussions.				
14	I would work harder if my teacher used VoiceThread more often.				
15	I know that using VoiceThread gives me opportunities to learn many new things.				
16	I can learn many things when my teacher uses VoiceThread.				
17	I enjoy completing online discussions using VoiceThread.				
18	I believe that the more often teachers use VoiceThread, the more I will enjoy online classes.				
19	I believe that it is important for me to learn how to use VoiceThread.				
20	I feel comfortable using VoiceThread.				

21	I enjoy using VoiceThread.				
22	I think it takes a longer amount of time to learn when my teacher uses VoiceThread.				
23	Using VoiceThread does not scare me at all.				
24	Using VoiceThread makes me nervous.				
25	Using VoiceThread is very frustrating.				
26	I will do as little work with VoiceThread as possible.				
27	VoiceThread is difficult to use.				
28	I can learn more from traditional online discussions (text only) than VoiceThread.				
29	I get a sinking feeling when I think of trying to use VoiceThread.				
30	What did you like best about using VoiceThread?				
31	What did you like least about using VoiceThread?				
32	Comments:				

APPENDIX F:

Course Evaluation Survey

APPENDIX F

COURSE EVALUATION SURVEY

	Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree
1. The instructor demonstrated a thorough knowledge of the subject matter for this course.	○	○	○	○	○
2. The instructor treated me with respect.	○	○	○	○	○
3. The course met the requirements outlined in the syllabus.	○	○	○	○	○
4. The learning objectives were clearly established for the course.	○	○	○	○	○
5. The class assignments helped me achieve the learning objectives and competencies.	○	○	○	○	○
6. Tests, quizzes and assignments were appropriate to the course objectives and competencies.	○	○	○	○	○
7. The textbook helped me achieve the learning objectives and competencies.	○	○	○	○	○
8. A copy of the course syllabus was provided to me.	○	○	○	○	○
9. The instructor's presentations and explanations were clear and effective.	○	○	○	○	○
10. The instructor explained and discussed the 10 work ethics characteristics.	○	○	○	○	○
11. Tests and assignments were graded and returned in a timely manner.	○	○	○	○	○
12. The instructor was organized and prepared for class.	○	○	○	○	○
13. The instructor used a variety of methods to teach the course objectives and competencies.	○	○	○	○	○
14. The instructor related course material to professional situations.	○	○	○	○	○
15. The instructor used the full class period effectively and appropriately.	○	○	○	○	○
16. The instructor was available to students outside the classroom.	○	○	○	○	○
17. The instructor provided feedback on my performance.	○	○	○	○	○
18. The instructor used a variety of assessments to measure my performance and learning.	○	○	○	○	○
19. If needed, support services such as tutoring or individual assistance were available for this course.	○	○	○	○	○

Comments:

APPENDIX G:

Course Evaluation Survey Comment Section- Control Group

APPENDIX G

COURSE EVALUATION SURVEY

COMMENT SECTION- CONTROL GROUP

Comment	Code
I enjoyed having Mrs. Johnson as my instructor this semester and am looking forward to having her as my instructor next semester as well. I have experienced the capabilities of achieving tasks at a higher level with Mrs. Johnson.	TC
The weekly attendance is a waste of time. Just one more than for a busy, full time working student to keep up with doing each week. If a student is involved with weekly discussions and submitting weekly assignments then why ask for them to log weekly attendance.	LE
I have learned a lot in this class. It has taught me how to write different letters, set margins, how to enhance a resume, and so on.	LE
This course has been very educational in my learning about how to use the computer in the medical field.	LE
Mrs. Johnson has taught her class very well. She is very accurate, punctual, and helps each and every one of us with all of our questions and needs in her class.	TC
I have enjoyed this class and learning all the different documents. I will keep my books so that I will always have a reference guide.	LE
Great teacher! Thanks.	TC

APPENDIX H:

Course Evaluation Survey Comment Section- Treatment Group

APPENDIX H

COURSE EVALUATION SURVEY

COMMENT SECTION- TREATMENT GROUP

Comment	Code
HEAVY WORKLOAD!	LE
I learned through the instructor's teaching measures. I loved that the instructor was quick to reply to my questions and also kept me as a student encouraged to do my best.	TC
Ms. Kayano Bell is an excellent instructor. Ms. Bell takes the time to communicate with her students. Whenever I needed help she was there. She responded to emails promptly, whether it was day, night, weekday or the weekends. I felt like I had nothing to worry about with Ms. Bell. If I had any problems, I knew she was there to help me to straighten them out and get it right. I would take another course from Ms. B in a heartbeat. She makes you feel welcomed and comfortable.	TC
Ms. Kayano Bell is a very helpful and understanding instructor. She was there to respond to my emails day, night, weekday or the weekends. I really have enjoyed her as an online instructor. She is a very professional woman and if I have any other subject to take, and she is the instructor, I would definitely enroll in her class. Why? I know I will be instructed correctly and learn the material at hand.	TC
Ms. Bell has truly been a great instructor and goes out her way to make sure you understand your work.	TC
I feel that Mrs. Bell is one of the best instructors that I have ever had. She always email you and keep you up to date on all assignments and anything else that she feel you need to know for class and she makes you feel like a real student. I would take a class from her again, whether it be online or classroom setting. Thanks Mrs. Bell.	TC
Ms. Bell was very helpful throughout this course. I fell behind in my assignments due to financial problems and she was more than willing to work with me and very understanding. Some instructors don't consider their students at all during these online courses. I thank her so much for all that she did for me throughout this semester!!!	TC
She has truly been one of the best instructors I have had thus far! I would highly recommend her to anyone in need of this class, and I look forward to more in the future.	TC
This is one of the easiest courses I've had and my instructor is awesome! She's always there when I need her for any questions or anything at all pertaining to helping me.	TC

I love my instructor, Ms. Kayano W. Bell. She has exemplified what a real teacher in my opinion should be. She never hesitated to get back with me after receiving an email from me and never hesitated to help no matter how small that help may have been. She is very knowledgeable about the course and I have enjoyed doing document production. I am very proud to have her as a teacher.	TC
Great teacher! Very helpful!	TC

APPENDIX I:

Multimedia Questionnaire Question 30 Responses

APPENDIX I

MULTIMEDIA QUESTIONNAIRE

QUESTION 30 RESPONSES

Question	Response	Code
30. What did you like best about using VoiceThread?	What I liked best about using Voice Thread was the fact that I was introduced to a new way of communication through technology. I was really infatuated and encouraged to use it more.	AW
30. What did you like best about using VoiceThread?	Having an alternative to learn and interact with fellow classmates.	AW
30. What did you like best about using VoiceThread?	I liked the visual and audio presentation to explain the assignment by teaching just as if I was sitting in a classroom.	MM
30. What did you like best about using VoiceThread?	Sometimes when you hear and see things you get a better understanding.	MM
30. What did you like best about using VoiceThread?	I like the different methods of presenting an answer.	MM
30. What did you like best about using VoiceThread?	What I liked best was that I didn't have to type all those words in my thoughts. I can just say what came to mind according to my work.	MM
30. What did you like best about using VoiceThread?	Videos	MM
30. What did you like best about using VoiceThread?	I like seeing the videos on how to complete assignments.	MM
30. What did you like best about using VoiceThread?	The videos	MM
30. What did you like best about using VoiceThread?	nothing	NA
30. What did you like best about using VoiceThread?	I disagree because I have not used voice thread yet.	NA
30. What did you like best about using VoiceThread?	Voicethread was very easy to understand, and it guides you through the assignment a whole lot better.	UF
30. What did you like best about using VoiceThread?	It was easier to make comments once I found my class.	UF
30. What did you like best about using VoiceThread?	Voicethread was very helpful to me. I would say easier to complete the discussions. My teacher explained it in detail that what helped understand fully.	UF
30. What did you like best about using VoiceThread?	I like everything about Voice Thread especially being able to see and hear my professor and classmates. Voice Thread made the class not feel like an online class. I really wish we used Voice Thread more often.	VF

30. What did you like best about using VoiceThread?	I could hear and see my teacher and classmates.	VF
30. What did you like best about using VoiceThread?	It is not any one particular thing that makes me like Voice Thread. The reason for that is because if you don't want to use the voice option, you don't have to. You have an option to text/type you response instead of showing your face. So if you are nervous then that would be your option. I didn't feel comfortable recording myself, so I used the text option myself.	VF
30. What did you like best about using VoiceThread?	I like the fact that I could talk to my fellow students, I have never done that before I thought at first I would not like it because you are talking in the front of people, but since they can't see you from the beginning you get relaxed and go with it.	VF
30. What did you like best about using VoiceThread?	I liked the idea of being able to communicate with my classmates and instructors and be able to see their pics on their profiles. I like putting a face with who I'm communicating with.	VF
30. What did you like best about using VoiceThread?	Actually being able to hear the instructor's voice and listening to her instructions.	VF

APPENDIX J:

Multimedia Questionnaire Question 31 Responses

APPENDIX J

MULTIMEDIA QUESTIONNAIRE

QUESTION 31 RESPONSES

Question	Response	Code
31. What did you like least about using VoiceThread?	Having to record my voice or show a picture.	AF
31. What did you like least about using VoiceThread?	I did not like the way that the search key was not directing me to the lesson.	AF
31. What did you like least about using VoiceThread?	I don't find it very useful in this class.	DL
31. What did you like least about using VoiceThread?	I like everything about it.	NI
31. What did you like least about using VoiceThread?	Nothing.	NI
31. What did you like least about using VoiceThread?	I like everything about Voice Thread	NI
31. What did you like least about using VoiceThread?	Nothing. I liked everything about it.	NI
31. What did you like least about using VoiceThread?	N/A	NI
31. What did you like least about using VoiceThread?	na	NI
31. What did you like least about using VoiceThread?	Nothing. Everything seems great.	NI
31. What did you like least about using VoiceThread?	I liked everything about VoiceThread.	NI
31. What did you like least about using VoiceThread?	nothing really	NI
31. What did you like least about using VoiceThread?	Nothing, once I really learned how to use it, it got me! I can really got hooked.	NI
31. What did you like least about using VoiceThread?	Nothing	NI
31. What did you like least about using VoiceThread?	I have no issues with voice thread yet.	NI
31. What did you like least about using VoiceThread?	Nothing	NI
31. What did you like least about using VoiceThread?	I liked it all.	NI
31. What did you like least about using VoiceThread?	When it had a popup that said I needed to spend 10 dollars in order to use it during class time	TI
31. What did you like least about using VoiceThread?	trying to use it	TI
31. What did you like least about using VoiceThread?	Getting logged in, finding my class and uploading the video. I got confused responding to classmates too.	TI

APPENDIX K:

Multimedia Questionnaire Comment Section

APPENDIX K

MULTIMEDIA QUESTIONNAIRE

COMMENT SECTION

Comment	Code
I would like to use it again in other classes.	EV
I really enjoy it and hope more teachers incorporate it in the future.	EV
I would like to say thanks for giving me another way of communicating. I really like the technology.	EV
Great program!	EV
I think VoiceThread can be good, but I have a difficult time with all the different logins Angel, GDP, email and then VoiceThread. My computer would block one on one day and another the next. It became overwhelming.	LI
Other than that VoiceThread is ok, there's really no different than the regular teaching technique.	ND
Voice Thread is okay, but it is not something that I would like to use constantly.	ND
I am excited still about Ms. Kayano Bell and her teaching. She made it simple and easy for me to learn and did not hesitate to email back within a day or the same day to answer my questions. She made sure grades were posted on time each week and it gave me a sense of confident that I could really do this! Thank you Ms. Bell for allowing me to be your student this summer and I hope to have you next semester.	TC

APPENDIX L:

Valdosta State University Institutional Review Board Protocol Exemption Report

APPENDIX L

VSU IRB PROTOCOL EXEMPTION REPORT

Institutional Review Board (IRB)
for the Protection of Human Research Participants

PROTOCOL NUMBER: **IRB-03083-2014** **INVESTIGATOR:** **Kayano Bell**

PROJECT TITLE: **A Time Series Study: Student Perceptions of Multimedia Discussion Features' Impact On Student Learning and Student Achievement**

INSTITUTIONAL REVIEW BOARD DETERMINATION:

This research protocol is **exempt** from Institutional Review Board oversight under Exemption Category(ies) 1&4. You may begin your study immediately. If the nature of the research project changes such that exemption criteria may no longer apply, please consult with the IRB Administrator (irb@valdosta.edu) before continuing your research.

ADDITIONAL COMMENTS/SUGGESTIONS:

Although not a requirement for exemption, the following suggestions are offered by the IRB Administrator to enhance the protection of participants and/or strengthen the research proposal:

NONE

☐ If this box is checked, please submit any documents you revise to the IRB Administrator at irb@valdosta.edu to ensure an updated record of your exemption.

Elizabeth W. Olphie *3/10/15*

Elizabeth W. Olphie, IRB Administrator Date

Thank you for submitting an IRB application.
Please direct questions to irb@valdosta.edu or 229-259-5045.

Revised: 12.13.12