2016

Examining U.S. Middle School Students' Achievement in a Blended Learning Environment

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Abstract

A Quantitative Study of a New Blended Learning Middle School: Is Middle School Too

Young?

by

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MA, University of Hawai`i, 1994

BA, Siena College, 1991

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Educational Leadership

Walden University

July 2016

Abstract

Many organizations, including schools are spending a significant portion of their budgets in order to create and implement more effective, efficient, and cost-effective ways to train their employees or to teach students. Research supports the use of e-courses as a way to fill that need. Several studies focused on the perceptions of the organizations and designers in higher education; however, there is a lack of research about the effectiveness of blended learning at the middle school level. There is an assumption that the studies in the current body of knowledge are transferrable to middle school students even though, adults taking blended courses can have very distinct reasons for enrolling in these types of courses, including but not limited to promotion. This nonexperimental quantitative study analyzed 6th and 7th grade middle school students' achievement scores after they took blended courses, one of which was delivered virtually and the other which was delivered face-to-face. The theoretical framework derives from Lev Vygotsky's (1978) social development theory and Jean Piaget's constructivist theory of knowledge. The central research questions were: What is the difference in achievement scores between the 6th grade students participating in a virtual course as compared to the 6th grade students participating in a face-to-face course? Is there a difference between the overall scores of the 6th grade students in the two respective courses as compared to the 7th grade students? The results of these analyses indicated that the 6th grade students scored higher than the 7th grade students in virtual learning, and virtual learning was higher in both grade levels. This study provided data that will influence organizational leaders' decision-making to use a blended learning model in the future for middle school.

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January 2016

Dedication

It is with great pleasure that I dedicate this dissertation to my parents, Isabel and Jose, my husband, David A. Brewster, and three sons, Aaron, Jon, and Blake. These six individuals have influenced me to reach my goals. My husband and sons have also sacrificed financially and personally, so that I could pursue a lifelong dream. They have also been my inspiration for moving forward with this vision during difficult points throughout the six years. I hope that this inspires my sons to continue to reach for their dreams despite any challenges that they face.

Acknowledgments

I would like to acknowledge Dr. Birnbaum and Dr. Stein for their hard work and dedication throughout my journey as a researcher. Their guidance was invaluable in allowing me to learn more about conducting research, and their positive demeanors kept me working towards my goal.

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Chapter 1: Introduction to the Study

This study includes achievement data from the inaugural sixth and seventh grade classes from a new blended learning middle school. It analyzed achievement data from sixth and seventh grade students after they completed a virtual social studies course and a face-to-face mathematics course. The data helped to answer the following research questions: What is the difference in achievement scores between the 6th grade students participating in a virtual course as compared to the 6th grade students participating in a face-to-face course? Is there a difference between the overall scores of the 6th grade students in the two respective courses as compared to the 7th grade students? The results of these analyses indicated that the 6th grade students scored higher than the 7th grade students in virtual learning, and virtual learning was higher in both grade levels. This study provided data that will influence organizational leaders' decision-making to use a blended learning model in the future for middle school.

The information from this investigation provided the organizational leaders and e-course developers data that can assist them in deciding if they should continue developing blended middle schools for sixth and seventh grade students. Additionally, the information will help guide them on when to introduce virtual courses in middle school, and if there should be a transitional phase during the sixth grade year. This can be particularly important for parents that believe that traditional teaching is more effective than online delivery.

The results of this study can be utilized to plan for follow-up studies that could investigate if there are other characteristics a student should have in order to be

successful in a blended learning environment. Are there other variables that should be considered, like a student's level of self-regulation, self-motivation, or satisfaction with the course? Ogunley (2010) suggested that future evaluations need to involve the learner in order to make online learning more effective, and Hsu (2011) recommended that studies in blended learning environments need to be conducted, because data on this topic is lacking.

The topic of blended learning in regard to middle school students is important because more schools, like this blended school in Maryland are being developed throughout the United States and some schools are being modeled after this school specifically. However, no research has demonstrated what age is too young in the middle school level to utilize a blended approach to learning. Can school developers make the assumption that sixth or even seventh grade is an appropriate time to introduce this model? Are the results of the most recent research transferable to younger students? Adults and middle school students could have very different motivations for attending school, and younger students are not typically given the option to pursue a school with a blended model. Therefore, this was an important time to analyze if younger middle school students were as successful as their older counterparts in their respective virtual courses, in order for stakeholders to support or not to support the development of these types of middle schools. In addition, what were the characteristics that are important for the students to have to be even more successful in a blended learning environment? This type of information continues to be important to developers, in order for them to develop

courses that are appropriate for the middle school child, and it is also important for stakeholders that are considering opening more blended schools.

This chapter presents background information on the variety of topics that derived from online learning and the problem that led to this study. The subtopics that will be discussed include how organizations utilized online learning to educate employees and students; also, how online learning gave students and workers more access to learning, while being more cost-effective. The main purpose for the study has been explicated, and the nature and the significance of the study, theoretical framework, and research questions presented. In addition, the terminology utilized in the study was presented; assumptions, scope and delimitations, and limitations explained.

Although several studies stated that online learning affords employees and older students with a more cost-effective way to learn, in addition to a convenient way to access courses that might otherwise have been inaccessible, were these courses actually as effective for middle school students when compared to face-to-face courses? Was this the best way for a sixth grade student to learn when compared to a seventh grade student? This was an important question, because several stakeholders are working towards opening more blended learning middle schools without clear data whether this is really the best way for a sixth or a seventh grade student to learn. A middle school student is very different from an employee that could be motivated by a future promotion or keeping up with the latest industry standards in order to remain employed, which does not typically apply to middle school students.

Background

Studies like the ones conducted by Baum (2013) and Sucaronmana (2013) were conducted at educational institutions. There were also several studies conducted at professional organizations that were increasing their use of technology to educate and train their employees (Womble, 2008; Yeung & Jordan 2007). "Electronic learning (e-learning) has been identified as an enabler for people and organizations to keep up with changes in the global economy" (Zaharias & Poylymenakou, 2009, pp. 76-77). Similar to work environments, the middle school in Maryland utilized the virtual option in order to allow students a different way to learn and to have access to more classes. For some organizations this option was a cost effective, efficient, and effective manner to deliver training (Baum, 2013; Ogunley, 2010). For other individuals, e-learning allowed for more flexibility and easier access (Ogunley, 2010; Yeung & Jordan, 2007; Zhang & Han 2012), with fewer restrictions. It appeared that many of these reasons were more applicable to adults than children.

In order to keep up with the growing demands for learning, some companies and schools outsourced their e-learning needs to modernize existing courses or to create new courses. Newer, more interactive and immersive approaches in online education provided students with convenient ways to meet immediate learning objectives, concomitant with prompt feedback about their overall progress. However, some of these outsource entities have not collected data in order to evaluate if blended learning was effective for middle school students and if there was a difference between the academic achievement of the students by grade level while controlling for age. Wong and Haung (2011) believed that an organization could increase employee and organization productivity through the implementation of online learning. Similar to work environments, studies showed that

virtual learners were more productive due to the opportunity to choose to proceed at their own pace. The American Society for Training and Development (ASTD) (2004, 2007) has estimated that companies have invested approximately $40 billion dollars per year on e-learning. "In 2013, organizations on average spent $1,208 per employee on training and development" (The American Society for Training and Development).

A blended learning school in Maryland is an example of an organization that has invested close to a million dollars in virtual courses and online curricula in one school year, hoping to give the students a more robust education with more options than they could if they had to hire a teacher for each course on-site. However, the extensive review of the literature in the following chapter verified that there are very few studies that pertain to the topic of blended learning for middle school students, and if this was an appropriate approach for young students. This study provided the school leaders and the course software developer constructive feedback on if the students' achievement had an impact on their academic achievement within the new blended learning model, which can then be utilized to adjust the model. In addition, this study supplied the researcher with data that will help schools capitalize even further on their e-learning endeavors. As a result of the study, the researcher has data to contribute to the body of knowledge regarding the effectiveness or lack of effectiveness in virtual learning for students in two distinct middle school grade levels. Although the historical data supported virtual learning, no data existed for the unique middle school student, or if blended learning modalities were as effective for the younger middle school students. The feedback will assist them in their quest to maximize learning outcomes and customer effectiveness. The

researcher will also found information that will help to eventually develop an evaluation protocol that the leaders and developers can utilize as they develop future bricks and mortar middle schools.

Problem Statement

The current body of knowledge is comprised of research studies that generally support the use of e-learning as an efficient (Yeung & Jordan, 2007) and effective teaching tool (Halawi, McCarthy, & Pires, 2009; Johnson, Geutal, & Falbe, 2009; Thang, Mustaffa, Wong, Noor, Mahmud, Latif, & Aziz, 2013). In addition, the majority of these studies utilized students from colleges and universities (Halawi, McCathy, & Pires, 2009; Dobbs, Waid, & del Carmen, 2007; Tawil, Ismail, Asshaari, Osman, Nopiah, & Zaharim, 2012). Thus, there was a lack of research based on secondary level schools (Yapice & Akbayin, 2012) and even less conducted in middle schools. Even though Batalla-Busquets and Pacheco-Bernal (2013) conducted a study regarding individuals that either took a face-to-face or virtual course, there were no studies that investigated middle school students' achievement data from face-to-face and virtual courses in a blended learning environment.

For many sixth grade students, this was their first year in middle school, which carried its own set of challenges. Although, the generation of middle school students appeared to have a command of technology, they never experienced taking a virtual course. Due to the unique qualities that middle school students sometimes possess, such as immaturity, a lack of self-motivation, the inability to self-regulate, coupled with the fact that school is not a choice for middle school students, was virtual delivery the

appropriate way to provide instruction to middle school students? Was this a better choice for older middle school students and not younger students? Was sixth grade too young? Was seventh grade too young? Due to the unique characteristics of the middle school child and their reasons for being in school, the results of the studies from the current body of knowledge were not easily transferable.

The current body of knowledge included studies that compared achievement scores with learning mode (Adam & Nel, 2009; Baum, 2013; Sucaronmana, 2013; Sulcic & Lesjack, 2009; Ogunley, 2010) with mixed results. However, they were all based on adult sample populations. Adults can be more self-motivated to attend school and succeed in order to earn a promotion or achieve a life-long goal. Middle school students are more likely to lack those mitigating factors. In addition, there are other investigations that have explored blended learning efficiency (Baum, 2013) and attitudes towards blending learning (Hsu, 2011; Thang, Mustaffa, Wong, Noor, Mahmud, Latif, & Aziz, 2013; Yapici & Akbayn, 2012; Zhang & Han 2012). The majority of the studies reported that the participants were supportive of the blended learning environment. This seemed appropriate since they chose those classes. Middle school students do not typically make these choices on their own accord. In addition, for the school being analyzed in the study, the students did not have a choice between virtual and face-to-face learning modalities. In this study all students were enrolled in virtual social studies and face-to-face mathematics classes.

With the increase in development and implementation of virtual courses to advance middle school students' knowledge, it was important to study about the learner's grade level while taking courses in this new type of learning environment. This will help to guide stakeholders during the design phase of blended schools. Should blended schools not offer so many virtual courses to sixth grade students as compared to older students? Would younger students be more successful if they were given a year to transition into this type of learning environment? "A key factor in the learning effectiveness of a blended course is the extent to which the course accommodates the student's preferences. A student who hates online learning or lacks the discipline for it will not learn well during the online activities of a blended course" (McCown, 210, p. 206).

Although a second blended learning middle school is under development in the United States, the two respective school districts and the e-learning companies do not have aggregate data to compare the achievement scores of the two different grade levels that completed both virtual social studies courses and face-to-face mathematics courses. In addition, an ANOVA has not been conducted in which the student population is attending middle school. In other words, was there a significant difference between the achievement scores in both the virtual and face-to-face courses for the sixth grade students as compared to the seventh grade students? Overall, this quantitative study was needed because organizations continue to develop more bricks and clicks middle schools.

This paper also referred to the existing studies that have explored online learning, and some have concluded that they were effective for adult students. However, studies on

effectiveness, such as the one conducted by Tawil, Ismail, Asshaari, Osman, Nopiah, and Zaharim (2012), demonstrated success only through the perception of the adult learner and not the middle school child.

Purpose of the Study

This nonexperimental quantitative study analyzed sixth and seventh grade middle school students' achievement scores, which was the dependent variable, to the independent variable, grade level, when they took the blended classes, one of which was delivered virtually and the other which was delivered face-to-face. After collecting and analyzing the data, the researcher has a better understanding of the effectiveness of virtual and face-to-face courses in sixth grade as compared to seventh grade. This information will be reported to the leaders in the school who have administrative oversight for these courses, as well as the course software developers. More broadly, the study will contribute additional data to the current body of knowledge related to blended learning as a viable option for middle school students.

This quantitative comparative study will fill the gap in learning about the effectiveness of the two delivery methods for both the sixth and seventh grade students in a new blended learning model. As a result, the organization will be able to determine if this approach is effective for each age group at this respective school.

Research Questions

This nonexperimental quantitative study compared the effects of course delivery (virtual and face-to-face) on academic achievement by comparing the average achievement score for a face-to-face math course with the average achievement score for

a virtual social studies course after controlling for the students' grade levels. The research questions were: The central research questions were: What is the difference in achievement scores between the 6th grade students participating in a virtual course as compared to the 6th grade students participating in a face-to-face course? Is there a difference between the overall scores of the 6th grade students in the two respective courses as compared to the 7th grade students?

Framework

This study applied two learning theories, Lev Vygotsky's (1978) social development theory and Jean Piaget's constructivist theory of knowledge. Both theories emphasize the importance of active and individualized learning, which can be achieved with an e-learning model. The social development theory emphasizes the importance of learning through actual experience with the environment (Vygotsky, 1978). This theory also states that the teacher should interact with the student as a guide or coach, not as a supplier of information. The course that the learners experienced will either utilize a virtual or a face-to-face teacher as a guide.

Analogous to Vygotsky's theory (1978), "Piaget's (1970) constructivist theory of knowledge is based on the assumption that learners do not copy or absorb ideas from the external world, but must construct their concepts through active and personal experimentation and observation" (Mayes & de Freitas, 2004, p. 15). This theory emphasizes that in order to learn new concepts the student must become involved in problem-solving activities. Moreover, feedback is also an important component of learning.

Similar to Vygotsky's (1978) zone of proximal development, the constructivist approach also advocates for individualized learning. Concepts are taught based on a slightly higher level than the student's current ability level. With guidance, the student will be able to gain new knowledge. In addition, "e-learning itself can be seen as both a tool and as a simulated activity system within which participants are introduced to and learn to perform the actions and operations" (Mayes & de Freitas, 2004, p. 19).

After receiving approval from the IRB, Prince George's County Public School's IRB department emailed a hyperlink that allowed the learners' parents to access information about the study. The link transferred learners to an external web site. At that time, they received a short synopsis about the research study. If they chose to continue, they were asked to complete an informed consent form before the researcher will be able to access the achievement data. Upon completing the survey, they were redirected to a page that thanked them for their participation.

Once the consent forms were signed, the researcher assigned each learner (study participant) a number in order to ensure anonymity during data analysis. Utilizing aliases for the participants protected their anonymity. Any personal information learned during the study was kept confidential and secured by abiding by the ethical code for researchers.

With respect to sample size, Creswell (2003) cleverly explained that in order to ensure that the sample size is suitable a power analysis should be utilized. However, I utilized the entire sixth and seventh grade population, which was equivalent to 297 students. The sampling was a convenience sample because the whole sample population

was enrolled in virtual social studies and face-to-face mathematics. However, I could only compare 35 sixth grade students to the 30 seventh grade students, because that was the total of parents who consented to the study.

The goal in this data collection process was to obtain the e-learners' grade levels and achievement data in order to engage in an in-depth data analysis. As the researcher, I collected data to verify the students' achievement scores for their mathematics and social studies courses, which became the framework for this study, as Creswell (2009) recommended.

The demographic data and the achievement scores were entered into the SPSS software program and also secured in document files. The SPSS software program helped me to easily retrieve data as well as store it securely off site. I organized the electronic files in order to easily retrieve, analyze, compare and contrast the data in order to determine if there was a significant difference between the achievement data between the two grade levels and two types of course delivery.

Nature of the Study

A quantitative study was the best choice for this study given the study's main goal: learning if face-to-face course delivery was more effective than virtual course delivery. "Quantitative research questions inquire about the relationships among variables that the investigator seeks to know. They are used frequently in social science research and especially in survey studies" (Creswell, 2008, p. 132). For this study, the researcher looked to discover if there was a correlation between achievement scores from a face-to-face course and a virtual course, while comparing grade levels, as well.

Definitions

This study utilized the following vocabulary that was grounded in the current body of knowledge:

Blended learning: "In the blended learning model, students can both take advantage of the teachers' lectures and be assisted by the Internet in choosing the appropriate content of learning materials according to their specific needs, and arranging self-paced study with the guidance of teachers, so that their all-round ability to use English could be improved and the best effects of learning could be achieved" (Zhang, 2012).

Blended learning: A learning model that allows teachers to deliver some instructional materials via online technology tools, while also teaching in the classroom.

Blended learning: A learning model that combines virtual courses and face-to-face courses.

E-courses: A course that allows a student to access recorded lessons at any time.

E-learning: Another way for students to access learning materials through the use of online delivery methods.

Face-to-Face: A teacher that works with students on campus and not virtually.

Online learning: A way for a student to learn online, which might or might not require the student to meet in a physical location.

On-site teacher: A teacher that works with students face-to-face on campus.

Virtual courses: Courses that are taught by a teacher that is in another location from the student.

Assumptions

As the researcher, I assumed that the student achievement data was accurate because it came directly from the online assessments. The other assumption in this study was that the assessments were valid.

The sample population came from one area, Prince George's County; therefore, one can assume that the population could not be generalized to a larger population.

Scope and Delimitations

The school offered several virtual courses; however, I chose to focus on social studies because it was the only course that all students were required to take. I also chose mathematics as the face-to-face course to study because it was another course that all students were required to take; therefore, it allowed me to have a larger sample size. I also chose to study the first group of sixth and seventh grade students because they were the inaugural class, thus, all students were new to this blended learning environment.

Limitations

The student population in this study came from one county, because they only qualified to attend this charter school if they lived in Prince George's County. As a result, the student population had a majority of African American students and 43% of the students qualified for free and reduced lunch. In addition, the school did not offer transportation; therefore, families that won the lottery, and were unable to provide their own transportation or pay for the private bus chose not to register their student.

Significance of the Study

This study analyzed achievement data for the two types of learning modalities, virtual and face-to-face for two different subjects, mathematics and social studies for two grade levels. The datum helped to answer the following research questions: What is the difference in achievement scores between the 6th grade students participating in a virtual course as compared to the 6th grade students participating in a face-to-face course? Is there a difference between the overall scores of the 6th grade students in the two respective courses as compared to the 7th grade students? More broadly, the study contributed much needed additional data to the current body of knowledge related to middle schools that plan on utilizing a blended learning model. As a result, it contributed information to a variety of sectors beyond the middle school level, including elementary and higher education, e-learning companies, and research consortia. Ideally, it provided empirical data that could influence organizational leaders' decision-making to use or not use virtual courses in a blended learning environment in the future.

Summary

This chapter introduced the research study, which collected and compared achievement data from two middle school grade levels, sixth and seventh. The discussion summarized how the investigation helped to determine if there was a significant difference between the two grade levels and ages after the students completed both a virtual social studies course and a face-to-face mathematics course.

A summary of the background information available in the current body of knowledge on the topic of online learning was also briefly introduced. The problem that

led to this study and the nature and significance of the study were also described, as it

pertained to an identified gap in the literature focused on middle school students

completing virtual and face-to-face e-courses. An explanation about what this study

provided to a variety of sectors was also included, which produced empirical data that

could help leaders and developers to enhance existing and future e-courses. This data is

important because there are stakeholders that are developing blended learning middle

schools without quantitative data on the effectiveness of this type of learning for younger

students. Therefore, the collection of quantitative data has provided the school's

stakeholders and future school developers information that could help them determine if a

blended learning approach is suitable for this age group. In addition, this information will

help to fill the gap in the current body of knowledge regarding virtual learning at the

middle school level.

The research questions, which were the basis for the study were revealed. In

addition, the framework was described as deriving from two main theories: Vygotsky's

(1978) social development theory and Piaget's (1970) constructivist theory of knowledge.

The conclusion of the first chapter supplies the terminology, assumptions, scope and

delimitations, and limitations of the study.

The second chapter will present an examination of relevant and current research

in the area of online learning, which will result in the following three themes:

effectiveness, authentic simulations and activities, and avatars and virtual guides. This

section will also include a detailed explanation of the literature search strategy that was

utilized. Additionally, a more detailed explanation of the conceptual framework

consisting of the social development theory and the cognitive development theory will be introduced and the latter chapter will be compared and contrasted in more detail, as well as synthesized throughout the literature review.

Chapter 2: Literature Review

Introduction

This chapter presents an extensive review on current research that pertained to e-learning. Although, several studies supported the implementation of e-learning in a variety of contexts (Ogunley, 2010; Sulcic & Lesjack, 2009; Yapici & Akbayin, 2012), there was a lack of research regarding middle school students' achievement data after taking virtual and face-to-face courses and how age affects their achievement scores. Therefore, the purpose of this quantitative study was to acquire valuable data in order to allow a variety of constituents a true account of the effectiveness of this blended learning model, and to explore if age affects their academic performance. As a result, the study contributed much needed additional data to the current body of knowledge related to blended learning as an effective option for middle school students. More specifically, it supported virtual learning as an effective method for sixth and seventh grade students to learn.

After an extensive review of the literature, four pertinent themes regarding e-learning surfaced. These themes were chosen because they were the four most common themes regarding the general topic of e-learning. The first theme pertains to articles that were seeking data in regard to the effectiveness of e-learning (Batalla-Busquets & Pacheco-Bernal, 2013; Dobbs, Waid, & del Carmen, 2009; Halawi, McCarthy & Pires, 2009; Lee & Lin, 2013; Ogunley, 2010; Tawil, Ismail, Asshaari, Osman, Nopiah, & Zaharim, 2012; Sampong, 2009; Sarmento, 2010; Wong & Huang, 2011;). Researchers, such as Halawi, McCarthy, and Pires (2009) explicated that e-learning has made it more

difficult for institutions to obtain accreditation, thus, they needed to justify the use of this mode of learning through evaluating for effectiveness. Sampong (2009) recommended that studies that provide evaluations of such programs will provide much needed information to sources of funding in order to justify that these programs are just as effective. Effective e-courses can have a positive impact on the quality and productivity of a business (Sarmento, 2010); this paper investigated the impact that e-courses can have on the educational sector. Understanding a learner's academic history can help the developers to enhance the courses' effectiveness; especially, in such a unique blended learning environment. Batalla-Busquets and Pacheco-Bernal (2013) agreed that there was a need to explore this method of learning. They found a gap in the literature regarding employers and virtual learning; more specifically, they claimed there was a lack of research that focused on the specific methodologies. The gap identified by Batalla-Busquets and Pacheco-Bernal (2013) is even larger regarding middle school students.

Similar to adults, students can benefit from mastering concepts in a safe environment. Providing effective e-learning programs that simulate possible scenarios can allow the learner opportunities to practice in a safe virtual environment (Lee & Lin, 2013). "Moreover, they also allow learners to experience situations that are difficult (even impossible) to achieve in reality, due to a number of factors: including cost, time, and safety concerns" (Kapralos, Hogan, Pribetic, & Dubrowski, 2011, p. 107). Lee and Lin (2013) believed that from a cognitive perspective, students should practice making and applying judgments and not just memorizing knowledge. Even though some researchers recognize the importance of authentic practice to enhance learning as well as

to allow for authentic practice, not much research has been conducted in this area, which reflects the second theme. Not many studies existed specifically about e-courses that incorporate real-world and interactive simulations that allow for immersive and authentic practice.

In addition to the virtual environment, the specific topic of avatars surfaced as a common theme in the literature review regarding e-learning. Taylor's (2011) research focused on learning if there was an emotional connection between the avatar and the learner, while Falloon (2010) addressed the use of avatars as presentation tools. Some researchers have even dedicated time to learning more about the impacts of creating avatars that look or do not look like the learner (Jin, 2010), as well as how the avatar's facial expressions affect a learner's cognitive processing (Sibuma, 2012). Commendador & Chi (2013) claimed that they filled the gap regarding avatars in online nursing education. However, no evidence was found regarding a learner's perception of e-courses that incorporated virtual and face-to-face guides, which in this study were represented by face-to-face, virtual teachers, online tutors/or cartoons that assisted the students, as needed.

The last area of focus incorporated many of the variables listed above, but it pertained specifically to blended learning environments. A blended model incorporates the two different learning modalities, face-to-face and online delivery. The studies included in the current body of knowledge were conducted in higher education settings (Hsu, 2011; Ogunley, 2010; Sulcic & Lesjak, 2009; Sucaromana, 2013; Zhang & Han, 2012), and most of those studies were seeking evidence of correlations between learning

modalities and academic achievement (Adam & Nel, 2009; Du, 2011; Sucaromana, 2013; Sulcic & Lesjak, 2009). Other blended learning investigations focus on student perspectives (Thang, Mustaffa, Wong, Noor, Mahmud, Latif, & Aziz, 2013; Ogunley, 2010), attitudes and satisfaction (Zhang, 2012) and their affect towards the blended learning experience (Hus, 2011; Ogunley, 2010). Even though most of the studies supported the use of blended learning modalities, there was a gap in finding support for the use of blended learning models in middle schools.

Literature Search Strategy

Only peer-reviewed journal articles were utilized for this literature review that focused on e-learning. The articles were accessed through the following databases: Educational Resources Information Center (ERIC) database, ProQuest database, as well as the Google search engine. The following search terms resulted in the articles utilized in the chapter: online learning, blended courses, virtual learning, middle school, virtual learning, e-courses, face-to-face courses, virtual courses, and e-learning.

Conceptual Framework

The existing body of knowledge consisted of a plethora of learning theories that were grouped into four general perspectives: behaviorist, cognitive, humanist, and social learning. Throughout history, each viewpoint either had an influence on or a reaction to another perspective. The behaviorist learning theories typically focus on observable behavior, not cognitive process like the cognitive learning theories. Similar to the behaviorist perspective, the social learning approach is based on interactions between people as a mechanism for learning. The social learning theory (Bandura, 1977)

suggested that observational learning can have a powerful effect on an individual's learning process, and that the effect is enhanced when the observers believe that the person demonstrating the behavior is similar to themselves. The humanistic view also emphasizes the importance of interaction; however, they believe that a learner gains understanding through interactions with their peers (Slavin, 1987), like the social learning perspective. Unlike the behaviorist perspective, the humanistic view emphasizes interaction, not observation.

This section regarding the conceptual framework of this study focused on two theories, Jean Piaget's cognitive development theory and Lev Vygotsky's social development theory. Each theorist's perspective on the development of intellect, memory, and learning was compared and contrasted.

The Development of Intellect

Learning theorists like Lev Vygotsky and Jean Piaget are interested in unfolding the possible ways that human beings acquire and process information, which leads to learning. Although theorists such as Vygotsky and Piaget focus on human cognitive development, they generated their very own unique perspectives on the topic. As a result, Vygotsky (1978) generated the social development theory, and Piaget (1972) created the cognitive development theory. Although, the theories are similar in many ways, they also have several differences.

Vygotsky's (1978) social development theory is based on the premise that learning occurs through experience and culture. Therefore, the social development theory promotes learning as a much more active process, which involves interactions between

the external environment and one's internal mental process. However, Piaget's (1972) cognitive development theory has a much more passive approach. More specifically, it specifies that mental development is a product of the natural sequence of four major stages. Moreover, one that builds from the previous stage in a sequential fashion. Unlike Jean Piaget, Vygotsky (1978) believed that this complex topic could not be due to a passive maturation process; therefore, development occurs as a result of social interaction and learning.

Vygotsky's (1978) social development theory suggests that cognitive development cannot occur in isolation; a person's interaction with the culture in which they live plays an important role, as well. Vygotsky (1978) also emphasized the importance of language as a way to convey information from the more knowledgeable other to the learner. He thought that, "…the most significant moment in the course of intellectual development, which gives birth to the purely human forms of practical and abstract intelligence, occurs when speech and practical activity, two previously completely independent lines of development, converge" (p. 24). Therefore, his perspective on acquiring knowledge is a more interactive process that precedes cognitive development. Conversely, Piaget's (1972) cognitive development theory posits that a person must reach a certain level of development before learning.

According to Flavell (1996), Piaget appropriately accentuated human beings as being naturally active and constructive in the assimilation-accommodation model of cognitive growth. This is similar to Vygotsky's (1978) belief of an individual applying practical activity; however, it is not a union, as described by Piaget (1972). Furthermore,

Piaget's perspective follows a prescribed cognitive pattern, in which an individual must first build on what they already understand and cannot skip over intermediate steps. In other words, cognitive development is a gradual process that builds upon the previous; in addition, the learner assimilates new information and accommodates it to build new knowledge (Flavell, Miller & Miller, 1993). Another researcher, Flavell (1996) also posits that the cognitive development model is a process that occurs in steps, much like building blocks that build upon each other.

Vygotsky (1978) expressed the importance of the cognitive process and interaction with the individual's environment. In addition, his social development theory also includes both a more knowledgeable other and movement through the zone of proximal development, a concept that he generated.

First, the more knowledgeable other serves as a guide as the individual learns. Through the act of collaboration with the more advanced facilitator, a person will gain a better understanding of the learning objective. Second, Vygotsky (1978) generated a term called the zone of proximal development. This is the area lying between where the individual is now, cognitively speaking, and where he or she could be with the help of a more knowledgeable individual (Vygotsky, 1978). An adult or more advanced peer can guide the learner through this zone of proximal development. Just as the degree of change possible through assimilation and accommodation was constrained in Piaget's theory, so was the zone of proximal development limited in Vygotsky's (1978) theory.

Comparable to Vygotsky's (1978) social development theory, the contextualists believe that a learner advances cognitively with the help of more knowledgeable others

within a respective context. In other words, students play the role of apprentices because an expert guides them in authentic situations. As a result, an individual learns from another by observing and listening to them, as well as learning from their explanations, which involves speech.

Vygotsky's (1978) contextualist approach to cognitive development suggests that a more knowledgeable other and guidance through the zone of proximal development will precede cognitive development. However, Piaget's (1972) cognitive development theory proposes that an individual must first have a developmental foundation before having the ability to learn.

Vygotsky (1978) stipulated that as a result of the child's development of intellect, the child will have the necessary foundation to utilize tools to produce more knowledge. "This unity of perception, speech, and action, which ultimately produces internalization of the visual field, constitutes the central subject matter for any analysis of the origin of uniquely human forms of behavior" (p. 26). Moreover, the requirement of having to actually manipulate an object is now exchanged for a more intricate psychological process. This internal intent and motivation helps the individual develop cognitively.

Similar to Vygotsky's (1978) process of internalization, once a child reaches Piaget's (1972) formal operations stage, they will also have the ability to imagine without having visual concrete objects. Piaget and Inhelder (1969) claimed that, the formal operations, allows for reality to be based on hypothetical or imagined scenarios.

> The whole development of mental activity from perception and habit to symbolic behavior and memory, and to the higher operations of reasoning and formal thought, is thus a function of this gradually increasing distance of interaction, and hence of the equilibrium between an assimilation of realities further and further

removed from the action itself and an accommodation of the latter to the former (Piaget, 2001, p. 19).

Analogous to Piaget's (2001) belief in the development of intelligence, Vygotsky (1978) theorized that an individual's practical intellect is developed once they internalize social speech. Vygotsky (1978) expounds that the development of intelligence is demonstrated when the person attempts to solve a dilemma that is just beyond their expertise. They attempt to achieve the goal by responding with a variety of cognitive functions, such as tools, as well as with communicative functions, which demonstrates that they have a much more complex system. Furthermore, this process also leads to memory function.

Vygotsky's (1978) social development theory and Piaget's (1972) cognitive development theory make us more aware of how intelligence is developed. The similar and yet unique accounts of how one processes information is based on opposite beliefs combined with some similarities.

Vygotsky's (1978) social development theory is based on the premise that interaction with the environment is what one of the first steps in allowing a person to develop knowledge. That coupled with guidance from a more knowledgeable other, adult or peer. The point of transition is when the person is in the zone of proximal development. As a result of these components an individual develops cognitively. On the other hand, Piaget's (1972) cognitive development theory is based on the perception that every human being must go through a series of four developmental stages in chronological order. In addition, as the person transitions from one stage to the next, the

individual undergoes a constant assimilation and accommodation process. As a result of this combination, new knowledge is formed.

The Development of Memory

There is an assortment of models of memory; however, Atkinson and Shiffrin produced one of the most popular models in 1968 (McLeod, 2007). Their multi-store model describes memory in terms of three different areas: sensory register, short-term or working memory, and long-term memory. According to this model, stimulation exists very briefly in the sensory register before moving on to short-term memory, which is a system of limited capacity. Unless a person does something quickly to the information, such as rehearse it or continuously repeat it, the information is lost forever. However, if the information is kept alive in short-term memory and eventually transferred to long-term, it joins the person's permanent memory and is then considered knowledge. Long-term memory possesses a large capacity and includes memory both in the broad and narrow sense (McLeod, 2007).

Craik & Lockhart (2008) explicated that some models of memory follow a levels-of-processing approach, which can help individuals retain more information because the new knowledge is assimilated to the existing knowledge, analogous to Piaget's (1972) assimilation-accommodation model. Once the knowledge is stored in memory, an individual should be able to retrieve the information as needed. Therefore, it is important for educators to understand how information is processed; knowledge is formed, and how it can be retrieved.

There are a variety of ways that individuals can remember information. According to Piaget's (1972) cognitive operational stage, when an individual sees a familiar object, it will trigger recognition. Therefore, at this cognitive developmental stage, an individual needs the actual external source in order to recognize the object. This form of memorization can be utilized for younger children that have not reached a more advanced stage of development. As for the act of recall, it has been described as a more complex and advanced way to access information. In other words, when one studies, the item or words are not visible externally in fact, the term recall is a process that requires an individual to retrieve the information from their respective memory (Flavell et al., 1993). This more complex process is analogous to Vygotsky's (1978) description of when a child reaches the stage of internalization of the visual field. This is the moment that is described as a child being free from having to utilize outside clues, as described in Piaget's (1972) formal operations. Moreover, Vygotsky (1978) clarifies that there is a critical difference between the more primitive function and the advanced one. The elementary function is a perception of an outside stimulus that elicits a response. However, the higher-level function is not a response to an outside stimulus; instead, the stimulus is created internally. Piaget and Inhelder (1969) described this process as the formal operations stage. This is finally when an individual can retrieve something from memory without having to actually see the object.

Learning

Remembering information is a vital function of learning. Therefore, the following discussion will focus on three different ways that help an individual to learn, according to

Piaget (1972) and Vygotsky (1986). The two categories that will be discussed in this section are: memory strategies and knowledge.

Some theorists, like Piaget believe that memory strategies are the first sign of cognitive development (Piaget, 1972; Piaget & Inhelder, 1969). The strategies consist of various activities that the more mature child will use in order to help them remember. An example of this strategy is when someone intentionally repeats a name or phrase, in an attempt to successfully store it in working memory.

Many examples of memory strategies include a variety of ways to associate people, items, and even colors, as in highlighting text, to the content that one is trying to make more permanent. Vygotsky (1978) stated that memory is triggered by external signs; additionally, the theorist firmly accepts as true that an individual's interaction with the environment will influence what they remember. For the very young child, Vygotsky (1978) purported they only recall concrete objects or concrete occasions that they have experienced. For example, a young child's recollection of what a mother is to them, might be how she feels in their arms; not necessarily the actual meaning of the word. Due to this very concrete stage of development, Vygotsky (1978) described the utilization of actual flash cards to serve as direct visual representations of objects, not symbolic representations as a good strategy for children. However, when children transition as they develop they will then be capable of more indirect methods of learning.

Rehearsing and organizing, also known as storage strategies, are examples of more complex strategies (Flavell et al., 1993). They are characteristically utilized when an individual has a need to store information into working memory. Conversely, retrieval

strategies are used to recover previous information that is already been stored in memory. Retrieval strategies are identified as a more advanced strategy when there is evidence of a sophisticated interchange between inference, memory fragments, and general knowledge.

The second item that can help an individual master learning is knowledge, which can be described as the information an individual has come to know. This type of information can be easily retrieved from memory. Like memory strategies, knowledge can also help individuals gain a better understanding of new concepts (Flavell et al., 1993).

Piaget's (1972) cognitive theory of development is based on biological maturation and a reciprocal process between the external environment and the person's internal schemata. Thus, Piaget's (1972) theory on learning entails three forms of knowledge: assimilation, accommodation, and equilibration. After obtaining a predetermined level of cognitive development, a human being will then undergo the three forms, which constantly regenerate existing knowledge and create new knowledge.

The first method of knowledge, assimilation, refers to adapting new inputs into an existing cognitive schema. The assimilation process will compare the new information to any existing information. Once the information is deemed similar or dissimilar, it is then accommodated, which is the second form. As a result, the cognitive structure is modified, also referred to as regenerated (Piaget, 1972). The third form, equilibration is the product of the external and internal process of assimilation and accommodation. The give-and-take process between the two forms will produce equilibration, which results in cognitive development.

Piaget's (1972) cognitive development theory supports the notion that information is regularly compared, contrasted, assimilated, and accommodated in order to improve cognitively. Thus, an individual develops cognitively when new information is added to a well-organized system of knowledge, by making the new product, or equilibration, more meaningful (Flavell et al., 1993). "In short, what the head knows has an enormous effect on what the head learns and remembers. But what the head knows changes enormously in the course of development, and these changes consequently make for changes in memory behavior" (Flavell et al., 1993, p. 255).

This section has demonstrated how Vygotsky's (1978) social development theory and Jean Piaget's (1972) cognitive development theory have a number of similarities and differences regarding human cognitive development. Vygotsky's (1978) social approach to learning, contrasts with Piaget's (1972) more biological and sequential perspective. Furthermore, Vygotsky's (1978) insistence that social interaction paves the way to cognitive development is partly contrary to Piaget's (1972) perspective. Piaget (1972) theorizes that a sequential four stage development and an assimilation and accommodation process between the external environment and the internal schemata allows the development of knowledge.

Although the two theories have some differences, they both posit that interaction with the environment can help to develop new knowledge. The current study revolved around a new blended learning model that introduced middle school students to new knowledge in a very unique way. The study's main objective was to compare the learners' academic achievement between a face-to-face course and a virtual course, as

well as learn if the variable, grade level, had an effect on their learning. The collection of

quantitative data was analyzed. The information will inform developers and school

leaders in order to help them determine if the course needs to be enhanced and if the use

of a blended learning model is effective for middle school students, which this study

demonstrated that it is effective. Additionally, the investigation helped to fill the gap,

which was identified during the literature review regarding middle school students taking

both face-to-face and virtual courses in a new blended learning environment.

Literature Review Related to Key Variables and/or Concepts

The literature review revealed four main topics regarding e-learning. The articles

referred to e-learning effectiveness generally supporting e-learning as an effective

learning tool in the context of schools (Halawi, McCarthy, & Pires, 2009) and as training

tools for a variety of work related topics (Batalla-Busquets & Pacheco-Bernal, 2013; Lee

& Lin, 2013; Sarmento, 2010; Schulman, Garcia, Wycoff, Duncan, Withum, & Graygo,

2012). The second theme, simulations in e-learning courses also supported the use of

authentic practice as an effective and safe way to process information cognitively (Lee &

Lin, 2013; Kapralos, Hogan, Pribetic, & Dubrowski, 2011) efficiently (Schulman, Garcia,

Wycoff, Duncan, Withum, & Graygo, 2012), and in a more interesting way (Lynch et al.,

2011). Additionally, studies such as the one conducted by Lynch-Sauer, VandenBosch,

Kron, Gjerde, Arato, Sen, and Fetters (2011) claimed that data on this topic is lacking.

The third theme that surfaced was in regard to the use of avatars in e-courses. This

section will review studies that look at variables such as the emotional connection

between the learner and the avatar (Taylor, 2011); avatars as presentation tools (Falloon,

2010); the impact of the avatar's appearance (Jin, 2010; Sibuma, 2012); and the effects of avatars in nursing education (Commendador & Chi, 2013). While most researchers report positive comments about the use of avatars, Omale, Hung, Luetkehans, & Cooke (2009) do not. The researchers stated that their study does not support the use of avatars.

The last area of focus incorporates many of the variables listed above, but it pertains specifically to blended learning environments. A blended model in this literature review incorporated the two different learning modalities, face-to-face and online delivery combined. There is no evidence of studies that research topics in the realm of a blended learning model that includes courses that are purely virtual and purely face-to-face, as in my study. The studies included in the current body of knowledge are conducted in higher education settings (Adam & Nel, 2009; Baum, 2013; Hsu, 2011; Sucaromana, 2013), and most of the studies are seeking evidence of correlations between learning modalities and academic achievement (Adam & Nel, 2009; Du, 2011; Sucaromana, 2013; Sulcic & Lesjak, 2009; Yapici & Akbayin, 2012). Other blended learning investigations focused on student perspectives (Hus, 2011; Thang, Mustaffa, Wong, Noor, Mahmud, Latif, & Aziz, 2013; Ogunley, 2010), attitudes and satisfaction (Zhang & Han 2012), and their affect towards the blended learning experience (Hus, 2011; Ogunley, 2010). Most studies supported the use of blended learning, while Omale et al.'s study (2009) did not. Although, the studies in the literature review were based on the other definition of blended learning, it was included to demonstrate the types of studies that exist regarding blended learning in general.

Effectiveness

The studies that investigated the effectiveness of e-learning primarily focused on the education, healthcare, or corporate sectors. A deficiency in research was identified regarding research focused on the effectiveness of e-learning in blended learning middle school models that included this age group and the other definition of blended learning, which is a combination of virtual courses and face-to-face courses. My study has helped to fill the identified gap by providing data about the effectiveness of virtual courses taken by middle school e-learners, specifically, sixth and seventh grade students.

Even though researchers have recognized the growth in e-course use in a variety of sectors, many are still seeking empirical data on the actual effectiveness of these courses. As a result of such a concern, the literature included a study conducted by Halawi, McCarthy, and Pires (2009). Their exploratory study focused on if e-learning is effective in a university setting by evaluating the quality of learning of the e-courses. Bloom's taxonomy is the theoretical framework, because it can help identify a student's preferred behavior patterns, which in turn provides researchers with valuable data (Halawi, McCarthy, & Pires, 2009). Bloom's taxonomy identified three categories to assess learning, but the researchers only focused on the cognitive skills section, which contained the following six objectives: knowledge, comprehension, application, analysis, synthesis, and evaluation (Halawi, McCarthy, & Pires, 2009). The research question for this study was: "What relation exists among individual-related factors, instructional factors, and e-learning through WebCT?" (p. 377). Teachers utilized WebCT as a portal for distributing course and testing materials, as well as a method to have discussions. The

researchers hypothesized that there was a positive relationship amongst individual and instructional variables (Halawi, McCarthy, & Pires, 2009).

The authors combined two measurement tools in order to measure individual instructional factors, and to assess student learning through WebCT (Halawi, McCarthy, & Pires, 2009). After analyzing 51 of the 75 surveys distributed to undergraduate students from the management information system program, the researchers concluded that individual (age and gender) and instructional factors did not have a significant effect on e-learning (Halawi, McCarthy, & Pires, 2009). However, there was evidence of learning after the students completed the e-course. Therefore, this study supported the notion that e-learning is an effective method of learning based on cognitive factors.

This quantitative study supported the use of online learning as an effective method of teaching due to the results of the students' scores. The data collected was also based on a comparison of independent variables such as time studying, learning styles, age, gender, ease of use of technology, and interaction with the professor. However, the sample size was a limitation to the study, as well as the fact that the study was only conducted in one subject area. My study will help to add to the body of literature because the investigation included two different subjects in two different learning modalities. In addition, my study provided even more detailed isolated data based on exact grade levels. Although this study identified an increase in learning through the use of e-learning tools, it did not provide any information about the effects of virtual or face-to-face courses for middle school students. Is it possible that virtual learning is not as effective for younger students? For example, the researchers tested for each learner's comprehension, as

suggested by Bloom's taxonomy. Does the visual, verbal, or organizational components of the technology interfere with the individual's cognitive process depending on their age, thus affecting their comprehension? According to Piaget's (1972) cognitive development theory, new information is constantly being compared and contrasted to existing knowledge; as a result, the information is assimilated and accommodated. Could the learner's grade level and lack of experience with a blended learning environment, or how the information is being presented create interference between what is being presented and the existing knowledge a person already knows, thus, not allowing for accommodation and assimilation? My study provided more information on how e-learning could have an effect on middle school students, because the results supports students taking virtual courses in middle school.

Halawi, McCarthy, and Pires (2009) also mentioned that age and gender did not seem to affect learning; however, socioeconomic differences were not tested. Could this unique variable vary the participants' comfort level with certain technology? If this was a factor, is it conceivable that the new information was presented in a format that is significantly different, thus creating a barrier between new knowledge and existing knowledge and not allowing for assimilation?

Dobbs, Waid, and del Carmen (2009) also believed that more studies are needed regarding students' perceptions about e-learning, especially, from students that have not experienced this method. As a result, Dobbs, Waid, and del Carmen (2009) directed a study in order to compare the perceptions of students that take online courses with those students that have not yet taken an e-course in the past.

The researchers collected data from a total of 280 students from a university located in the Southwest. Of the 280 students, 180 were enrolled in criminal justice courses, while the other 100 students were enrolled in the same course, but through the online program (Dobbs, Waid, & del Carmen, 2009). After the self-administered surveys were analyzed, the researchers reported that 44.4% of the students that had taken the online courses felt that they learned an equal amount than when they took traditional courses; furthermore, 29.6% of the students claimed they learned even more (Dobbs, Waid, & del Carmen, 2009). Also conveyed was that "just over half of those who had taken online courses reported that they preferred online courses, with 35.2% reporting that they preferred traditional courses and 14.5% reporting that they did not have a preference" (p. 16). Is it plausible that these results reflected human nature's preference for what is comfortable to an individual and to what already exists in their memory? My study added to the current body of knowledge in regard to a younger age group. My sample population consisted of students that have grown up with technology their whole lives and they demonstrated more success with virtual as compared to face-to-face learning. The research supported the notion that the success that students experience academically in a new blended learning environment was more significant in sixth grade. My study supported students as young as in 6th grade taking virtual courses.

Opposite the students who were already exposed to the online course, the students that did not have experience with this type of learning felt that they were time-consuming and that they were not as high quality as compared to traditional learning (Dobbs, Waid, & del Carmen, 2009). Similar to Piaget's assimilation-accommodation model, is it

difficult for individuals to accommodate a new learning tool if they do not have anything in their existing memory to compare it to? The more classes a student took, the more likely they agreed that e-courses were of high quality. It appeared as if experience had a lot to do with the positive outlook of online courses. My study investigated whether a lack of experience in the blended learning environment had an effect on their academic achievement in the face-to-face class as compared to the virtual one.

Similar to Halawi, McCarthy, and Pires (2009), Tawil, Ismail, Asshaari, Osman, Nopiah, and Zaharim (2012) were also interested in determining if e-learning was an effective method of learning in the education sector. Unlike the aforementioned study, their study focused on mathematics and statistics courses.

Since engineering courses are typically taught with a lecture format, Tawil et al. (2012) felt that determining whether e-learning is effective in these respective courses will be beneficial to students, as it would be more cost-effective. In order to determine which method was more effective regarding lecturing methods, Tawil et al. decided to design the study to determine if there was a significant difference between the online versions of mathematics and statistics courses as compared to mathematics and statistics courses delivered traditionally.

The quantitative data was gathered by administering a set of questionnaires, a 5-point Likert scale, to the students of the respective classes. There were 182 student participants for the mathematics courses and a total of 179 student participants in the statistics courses that were either in their first or second year of an engineering program Tawil et al., 2012). The researchers found a significant difference between the students'

perceptions of e-learning courses and the traditional lecturing classes. The sample

population felt that the lecturing format in both the traditional mathematics and

inferential statistics classes were more effective in explaining and helping with the topics

at hand. It is important to note that the traditional lecturing method also involved group

lecturing and discussions. It is unknown if this variable had an effect on the outcome of

the study. Also, since the WileyPlus program was a new format for these students, could

the comfort level have been a factor in the results? If there was the presence of a virtual

guide or an on-site teacher, would that have eased the transition into this new e-learning

format? If the students had the opportunity to collaborate with classmates after reviewing

the lecture notes individually, would this have had an effect, as well? According to

Vygotsky's (1978) social development theory, learning occurs when an individual

interacts with the external environment; learning does not occur in isolation. Therefore, it

appeared that the variable of collaboration could have had an impact on the results of the

study. Would this study have benefitted from an open-ended question survey in order to

determine other possible reasons why the participants preferred the lecturing method?

Was it possible that the fact that lecturing was the typical format for these types of classes

caused discomfort in the sample population, which hindered their ability to accept the

new method?

  Dissimilar to the previous studies, Sampong's (2009) quantitative evaluation

study focused on a specific student population, teacher trainees and faculty/administrators

that were also employees. Sampong evaluated the effectiveness of a distance education

teacher preparation program created for teachers in Ghana after identifying any gaps

between teacher trainees' standards and performance. The focus of the study was on course effectiveness and if there was alignment of standards between day-to-day and course standards. Similar to Halawi, McCarthy, and Pires (2009), Sampong found evidence of e-learning effectiveness from the data gathered.

In order to determine if the program was aligned with the teachers' actual day-to-day standards, the researcher randomly distributed two surveys to the sample population, which consisted of both 365 teacher trainee students and 186 faculty members and administrators (Sampong, 2009). "Usable returned questionnaires yielded a response rate of 41% of students and 42% of faculty/administrators" (p. 7). Although the results demonstrated some discrepancies between the actual program's standards and the actual teachers' work standards, the study supported Sampong's hypothesis that the teacher trainee program was effective in promoting teacher training. Thus, the other conclusion that Sampong made was that distance education provided individuals with another way to obtain an education or training without the typical factors that typically hindered attending classes in a traditional manner. However, it is imperative to note that the students had opportunities to meet with tutors. Similar to Tawil et al.'s (2012) study, the variable of interacting with others, this time only a tutor, could have impacted the results of the study, thus, demonstrating the need for studies that are conducted online with outside intervention.

My study provided more support for this study regarding face-to-face and online education, since the student population in my study had tutors assisting them. The two studies were molded after Vygotsky's (1978) social development theory because

interaction between tutor and student existed, in addition to online course delivery. The middle school students were also engaged in active learning, and the study also resulted in high achievement scores in virtual learning.

Closely related to the study conducted by Sampong (2009), Sarmento (2010) also conducted a study that focused on exploring an e-course by measuring the product's quality in the real-world. By gathering data about the quality and productivity levels of several hotels, Sarmento investigated an e-course's effectiveness utilized for training employees from the corporate sector.

Sarmento's (2010) analysis derived from collecting a 40 question survey from a total of 34 valid replies received from a variety of hotel managers. The hotels were chosen to participate if they partook in e-learning for educational or training purposes. The surveys revealed that 79.4% of the hotel managers felt that there was an increase in their respective employees' performance quality levels due to e-learning. In addition to productivity and performance quality, Sarmento reported that by implementing e-learning to stay abreast of ongoing changes in the industry, the hotel remained competitive, while saving money on training.

There were several unknown details about the e-learning courses utilized in Sarmento's (2010) study because the courses were not described. However, similar to Sampong's (2009) study, the course referred to in Sarmento's study involved individuals that were also working in their respective fields. If Vygotsky's (1978) social development theory is accurate, the interactivity that employees have in their day-to-day work environments should influence their learning.

Batalla-Busquets and Pacheco-Bernal (2013) found that the area of virtual on-the-job training has been investigated in the past, but only from the point of view of the organization. Therefore, Batalla-Busquets and Pacheco-Bernal investigate employees' perspectives of virtual training, while seeking more knowledge about what actually motivated the individuals to pursue this form of training.

Batalla-Busquets and Pacheco-Bernal (2013) emailed a questionnaire to a total of 2,000 bank employees, which had participated in two distinct virtual training courses or the equivalent in a face-to-face teaching form. Of the 2,000 employees contacted, 413 employees replied and were interviewed. Since the sample population was stratified, the employees that took the virtual course for new employees were categorized separately from the sample that participated in the course that focused only on promotions.

Were the participants' attitudes reminiscent of the perspectives of Tawil et al.'s (2012) sample population? Were the similarities in results due to the employees' comfort levels with the new form of training, or even their lack of understanding the processes of learning? The results identified that the participants claimed that the virtual courses offered more flexibility, pace of study, and in-depth knowledge, which could be related to successful learning. However, they felt that the traditional course option motivated them more, allowed for clarification, facilitated more learning, allowed for more practical focus, and more professional associations (Batalla-Busquets & Pacheco-Bernal, 2013), which appeared to be based more on social factors. Therefore, the results aligned well with Vygotsky's (1978) social development theory. This theory posits that an individual will advance cognitively more effectively with the assistance of a more knowledgeable

other. It seemed reasonable to believe that the on demand explanations and feedback received from the online platform could have facilitated learning. Therefore, this study did not provide enough data to allow one to determine the actual effectiveness of the courses; however, it did provide insight as to what the learners perceived as being an effective course. My study did not yield similar results. The comfort of face-to-face classes did not appear to result in more positive results in the students' achievement data towards the more traditional classroom setting. The average score for both virtual courses were higher than the average scores for the face-to-face courses.

In this respective study, one of the courses was required, and 92.7% of respondents claimed that taking these courses was a way to maintain their employment, which was not a concern for middle school students. Although this study provided the perspectives of the e-learners on training topics, the topics covered were not directly related to their day-to-day work duties like the study conducted by Sampong (2009). Therefore, motivation to become promoted could have played a significant role in their feedback about the training course. It is plausible that their ability to practice what they learned allowed them to learn more like Vygotsky suggested, or they were more motivated by wanting to keep their jobs.

The study conducted by Wong and Huang (2011) also analyzed the end-users' perspectives on e-learning; however, the focus of their opinions were on the effects of the quality of the e-learning system service, and if they felt this was an effective way to achieve organizational learning.

Employees from 15 Taiwanese companies were targeted if they utilized an e-learning technology during the last six months (Wong & Huang, 2011). The participants were asked to complete a survey instrument, which was tested for face and content validity (Wong & Huang, 2011). The results supported the notion that employees were satisfied and willing to complete the e-training if the system was aligned with their work tasks while also being operational. This, in turn had a positive effect on organizational learning, thus, supporting the first hypothesis (Wong & Huang, 2011). However, the researchers did not have evidence to support the second hypothesis, because the participants did not feel that the quality of the e-learning system affected organizational learning, but it did have an effect on acceptance and use of e-learning (Wong & Huang, 2011). Therefore, the authors concluded that if end-users were satisfied with the product, it would have had a positive effect on organizational learning. Could this have been a result of the assimilation-accommodation model? Could the comfort of learning about the topics that were similar to their existing work resulted in the population's positive perception of the course?

Lee and Lin (2013) also focused on the e-learners' perspectives, but as only one part of the mixed methods study. Overall, they found evidence of learning in the healthcare industry. Studies about e-learning courses to advance medical care can allow students the opportunity to practice without inconveniencing patients. The respective e-course in this study was a supplemental program that allowed nurses in training to practice and connect knowledge regarding pediatric medication management and basic nursing skills (Lee & Lin, 2013). This convenience factor also existed in my study; the

students were able to view videos about social studies topics as well as practice utilizing

math manipulatives without the inconvenience and extra expense.

The convenience sample for this study consisted of 349 participants, which were

further divided into a comparison group (80) and an intervention group (269) (Lee & Lin,

2013). Both groups received a lecture course and practicum; however, the intervention

group also completed the 8 module e-learning course, which integrated previously

learned material. They were asked to complete a 5 point Likert scale, which helped to

determine if the e-learning program was in relation the to the experience of the learner

(Lee & Lin, 2013).

After conducting a pretest, after the lecture portion of the course was completed,

the quantitative data showed a higher understanding of pediatric medication management

for the comparison group than the intervention group. However, the post-test revealed a

significant difference between the two groups in favor of the intervention group.

Therefore, the researchers concluded that e-learning was an effective supplemental

learning modality for nurses in training (Lee & Lin, 2013). Since both the virtual and

face-to-face courses in my study had online delivery, did the extra hands on practice

provided by the face-to-face teacher allow for more in-depth learning, as suggested by

Vygotsky's (1978) social development theory? No, the results of the study support the

fully virtual learning over the online with face-to-face teacher.

In addition to the quantitative data, the researchers also collected qualitative data

from the participants; this demonstrated support for the e-learning program. They claimed

that the variety of video clips based on the topics covered, along with the ability to

review at will proved to be extremely effective in their ability to retrieve the information

during the post-test. "In this study, organized and integrated content with explanations

and demonstrations helped the students keep key-points and pictures in mind on what

they could possibly encounter in the clinical settings" (p. 382).

This study supported Vygotsky's social development theory, similar to Batalla-

Busquets & Pacheco-Bernal's (2013), which was cited earlier. Lee and Lin's (2013)

findings supported the opinion that learning should be a more active process between the

environment and the learner's mental process. Although the students did not actually

interact with authentic patients, the variety of video clips which introduced them to a

plethora of scenarios could prove that this form of learning can be just as effective as

actual hands-on learning.

Due to the fact that this study followed a pattern that exposed all of the students to

the lecture portion of the class, pre-tested the participants, and then exposed them to the

practicum portion of the course, could be considered a potential limitation. After that

second exposure to the hands on practicum, it was difficult to determine if the positive

effect on the intervention group was only due to the supplemental e-learning program.

Did the three levels of exposure to the information at different points in time allow the

learners to build their knowledge, as endorsed by Vygostsky's (1978) social development

theory? Unlike Lee and Lin's (2013) study, the student's in the e-course research

investigation did not have extra contact with the content of the course before

experiencing the phenomenon.

Schulman, Garcia, Wycoff, Duncan, Withum, and Graygo (2012) also conducted a research study based on the healthcare sector; however, their study's purpose was to determine if a military health professional would benefit from the use of mobile e-learning in place of traditional lectures at the point-of-care.

The population sample consisted of 113 members of the U.S. Army's Forward Surgical Team that are training. The participants were either assigned to the control group of the mobile learning group randomly. The members of the control group received training through a 45-minute didactic traditional lecture method, which included a PowerPoint presentation lecture. The control group utilized a mobile device to view a 10-minute video with animated lecture about medical shock only one time; however, the lecture and script were the same as the one used in the control group (Schulman et al., 2012).

The measurement tools were pre- and post-tests, which evaluated their knowledge about medical shock. Even though both groups increased their test scores, the researcher did not find a significant difference between the two groups (Schulman et al., 2012). Thus, Schulman et al. concluded that mobile learning was an effective learning tool. Additionally, the researchers admitted that another post-test would have been beneficial to measure for retention.

The studies referred to in this section were conducted either in the healthcare, corporate, and education divisions. My study was conducted in the education sector, but unlike the articles cited in this section (Dobbs, Waid, & del Carmen, 2009; Halawi,

McCathy, and Pires, 2009; Tawil, Ismail, Asshaari, Osman, Nopiah, and Zaharim, 2012), it helped to fill the gap in blended learning environments at the middle school level.

Similar to the studies conducted by Batalla-Busquets & Pacheco-Bernal, 2013; Halawi, McCarthy, and Pires (2009); Dobbs, Waid, and del Carmen (2009); Tawil, Ismail, Asshaari, Osman, Nopiah, and Zaharim (2012); Sampong, 2009; Sarmento (2010); Wong and Huang, 2011; Lee and Lin, 2013; Schulman, Garcia, Wycoff, Duncan, and Graygo, 2012, my study demonstrated that the data supported the use of online learning. More specifically, my study focused on a comparison between two different learning modalities, face-to-face and virtual for two different grade levels.

Due to the overwhelming results from the previous studies regarding effectiveness of e-learning, my study began with the assumption that this was an effective way to learn. However, my study concentrated on which learning modality was the most effective for each age group based on the students' achievement scores for both their face-to-face course and their virtual course.

The results of my study helped to fill the gap that Dobbs, Waid, and del Carmen (2009) filled for the university student population, because this study was specifically designed for younger students. The investigation allowed for more research that focused on e-learning in mathematics courses like the study conducted by Tawil, et al., (2012).

The blended learning model in my study allowed for flexibility and pace of study as described by Batalla- Busquets and Pacheco-Bernall (2013). However, those researchers claimed that their participants felt that the traditional course was more motivating. My study's results did not support previous investigations, because it was

determined that the middle school students did not achieve higher scores in the face-to-face courses.

Although the results to my study did not support the existing investigations in the current body of knowledge, it was still an asset to the topic of blended learning. This is especially true because there continues to be a lack of studies that focus on online learning in a blended learning environment, especially in middle schools.

Authentic Simulations and Activities

The current body of literature also has a plethora of articles regarding the use of simulations in a variety of learning methods. However, most investigations focused on healthcare simulations that involved the use of electronic patients or 3D virtual environments such as the multi-user virtual environment SecondLife (Mamo, Namuth-Covert, Guru, Nugent, Phillips, Sandall, Kettler, & McCallister, 2011). "This technology is a digitally constructed persistent virtual environment that facilitates collaboration and interaction" (Mamo et al., 2011, p. 114). Research studies that integrated authentic simulations used in e-learning that allowed for immersive and authentic activities were not as prevalent in the current literature. Although, this literature review yielded several articles, it was abundantly clear that it was not as common a theme as compared to the previous focus. The particular emphasis on integration of authentic simulations was a vital component to this literature review because my research study was conducted with middle school students that utilized authentic simulations to engage the learners and to allow for authentic practice, some of which are in real time. Thus, studies that investigated only authentic simulations such as video (VandenBosch, Kron, Gjerde,

Arato, Sen, & Fetters, 2011), virtual scenarios, media, games (Kapralos, Hogan, Pribetic, & Dubrowski, 2011; Lee & Lin, 2013), and mobile learning (Schulman, Garcia, Wycoff, Duncan, Withum, & Graygo, 2012) were included in the literature review.

Kapralos, Hogan, Pribetic, and Dubrowski (2011) defined activities that included simulations as an effective learning tool. As the researchers explained, this was particularly important if there were limitations due to a lack of finances and time. This study was important to my study because the middle school mathematics and social studies courses also utilized simulations, which allowed the students opportunities that the school would not typically be able to provide the students.

Kapralos et al. (2011) postulated that one of the components missing from designing effective virtual activities, like games and simulations, were the learners' and educators' perspectives of the activities. As a result, Kapralos et al.'s study measured the perspectives of the e-learners and faculty after utilizing virtual simulations and academic games. They were also interested in learning more about the e-learners' video game behaviors (Kapralos et al., 2011). Although, the authors were investigating the learners' perspectives, the study did not concentrate on the students' achievement scores. My study added to the body of knowledge on this topic.

The sample population consisted of students and teachers from the University of Ontario's Institute of Technology. The participants completed two surveys through Survey monkey, which contained both open and closed-ended questions, in order to collect data about their perceptions and their video game habits. The only requirement to anonymously participate in the study was that the student had to be enrolled at the

university. For the participants that were teachers, they were required to teach a course during the time of the study. The survey was made available to a total of 5,500 enrolled students, 245 faculty members (Kapralos et al., 2011), which was a significant sample size.

Kapralos et al. (2011) analyzed the data that was collected from 232 students and 18 faculty members, which translated into 4% and 14% respectively. For the first survey, Kapralos et al. concluded that 78% of the students had positive comments about the simulations and games. They felt that the activities helped them comprehend the theories presented throughout the course, thus, finding them to be useful. These results followed Vygotsky's (1978) social development theory, in that it theorized learning as an active process, which was what the activities allow. In regard to the second survey, 79% of the total sample population had significant experience playing video games (Kapralos et al., 2011).

Kapralos et al. (2011) revealed that the majority of the participants were millennial students; therefore, their comfort level with technology together with the way that they learned best, which was by reading and doing, was beneficial for this type of learning. Thus, due to this fact and that this university is a lap-top based university the researchers suggested that future research should consider the perceptions and use of simulations at other non-technology-focused institutions and compare the new findings to the results presented from their investigation (Kapralos et al., 2011). My study went further because it was seeking data based on younger students.

Although the researchers claimed that the age factor could have been a variable in this study that led to a positive perspective of e-learning, other researchers such as Halawi, McCarthy, and Pires (2009) reported that age did not have a significant effect on e-learning for their respective study. Even if Kapralos et al., (2011) decided to test for the variable of age, the fact that the university was a laptop based school, most likely attracted a younger population. My study helped to support one of the above studies because it was also based on a school that is based on a one-to-one laptop school, but it was their first year at such an institution.

Similar to Kapralos (2011), Lynch-Sauer, VandenBosch, Kron, Gjerde, Arato, Sen, and Fetters' (2011) sample population also included millennial students. However, in this study, they were nursing not technology students. Another similarity between the respective studies was that they both focused on each e-learner's perspective of their experience utilizing computer games and new media. Lynch-Sauer et al. (2011) felt that this type of data will be very helpful to the future of nursing education.

After consulting with experts, Lynch-Sauer et al. (2011) generated a 30 item survey, which included questions about the e-learners' demographic data, attitudes, experiences, and beliefs about a variety of variables. The researchers invited undergraduate and graduate nursing students from two respective universities by email. The invitation was sent to a total of 600 students, which provided a hyperlink to the online survey. Of the 600 students invited to participate in the study, 218 student surveys were returned. After Lynch-Sauer et al. (2011) analyzed the data, they concluded that "forty-one percent of undergraduate and 25% of graduate nursing student respondents

reported playing games" (p. 516). Even those students that did not identify themselves as game players reported positively to the idea of being able to utilize games and new media in their future nursing courses, which was 94% of the sample population (Lynch-Sauer et al., 2011). Furthermore, 88% of the participants preferred that more courses in the nursing program incorporate more games and new media throughout the nursing programs (Lynch-Sauer et al., 2011). As a result of the data, Lynch-Sauer et al. (2011) explicated that they supported the notion of nursing faculty learning to utilize technology in order to better serve the millennial student. If Vygotsky's (1978) social development theory is accurate, it would have behooved the researchers to investigate further if this need that they described of the millennial student was truly generational. Could it be that all students would have benefitted from new media technologies because it allowed for active practice and guidance from the videos? Since this study was only based on the target population's opinion, it did not provide evidence of effectiveness of online learning by game like media. My study provided data that supported Lynch-Sauer et al.'s (2011) claim.

As described in the previous section, Lee and Lin (2013) generated an intervention study to determine the effectiveness of a new e-learning program in Taiwan for nurses. The e-course in this study, similar to the latter study by Lynch-Sauer et al. (2011), also collected data based on the participants' perspectives. Like Lynch-Sauer et al. (2011), the qualitative portion of the data collected by Lee and Lin (2013) revealed overwhelming support for the incorporation of media.

As described earlier, Schulman, Garcia, Wycoff, Duncan, Withum, and Graygo (2012) also conducted a research study based in the healthcare sector and mobile learning. The researchers concluded that the healthcare professionals that viewed a 10-minute lecture presented as a video and animation was just as effective as a 45-minute didactic lecture. Moreover, the mobile learning method saved the participants much more time, as well as allowed for much more flexibility.

Several studies supported the use of e-learning. However, several of the studies had other variables such as real world experience. It is unknown if the effects of the study would have met the reliability test without hands-on-experience. The study included a sample population that was not exposed to hands-on-learning in addition to the simulations in the e-course. Therefore, the data from the study did not have that extra variable that could have affected reliability of the study.

Although there are a few investigations that focused on learning and the use of virtual activities, several of the research studies focused on the target population's perceptions and not actual quantitative data (Kapralos et al., 2011; Lynch-Sauer et al., 2011). The existing body of knowledge had a lack of literature that demonstrates the effectiveness of authentic simulations and activities that were incorporated into online learning. My study provided quantitative data based on the effectiveness of courses that utilized a plethora of videos, real-time practice, and authentic practice activities. More importantly, the data focused on students in the middle school level, which was not commonly found in the current literature.

The population in Kapralos' (2011) study claimed to have had ample experience playing video games and Lee and Lin's (2013) target sample consisted of millennial students; therefore, my study assumed that the younger population, middle school students, would be even more, if not just as comfortable with video and game media. If this was true, then Piaget's (1972) theory of learning should be accurate. The three forms of knowledge: assimilation, accommodation, and equilibration should allow the students to constantly regenerate existing knowledge and create new knowledge. If younger middle school students already have existing knowledge about content and the comfort level of media, then the students should have done well in the course according to this theory in both sixth and seventh grades. However, Piaget (1972) also pointed out that the maturation level is also a factor. However, my study did not support this theory, because the sixth grade achievement scores were higher in sixth grade

Schulman, Garcia, Wycoff, Duncan, Withum, and Graygo's (2012) study supported my study in which watching a video lecture was just as effective as a didactic lecture. This notion is supported by Piaget's (1972) social development theory. If this theory is accurate, then my study should have demonstrated that the virtual course was as effective as the face-to-face course. In fact, the study supported virtual learning over face-to-face.

Avatars and Virtual Guides

Many articles included in this literature review reported that the corresponding participants preferred or thought that learning from an instructor is more effective (Batalla-Busquets & Pacheco-Bernal, 2013; Tawil et al., 2012), while other studies

reported higher levels of student engagement (Falloon, 2010). As mentioned previously, it is unknown if the participants were reacting to an uncomfortable and new technology. Therefore, it is reasonable to wonder if the use of avatars or Live Lessons with their virtual teachers would have helped the participants that were not experienced with the new tools.

In regard to maintaining knowledge, would the use of avatars or a guide embedded within the software program have helped with the discomfort? Would this approach have benefited the participants? Peterson (2005) asserted, "avatars are online manifestations of self in a virtual world (Kim, 2000) and are designed to enhance interaction in virtual space" (p. 30). There are several research investigations that focused on avatars within virtual worlds within this definition. As de Freitas (2006) explained, it is more common to see avatars utilized for games and social networking, but not in educational settings. This belief is also supported by this literature review, because ample articles were found regarding avatars in virtual worlds, but not regarding their use as virtual coaches or guides within an educational context. Therefore, the topic of avatars clearly surfaced as the third theme.

Some studies referred to e-courses that investigated if avatars helped the learners cognitively, as well as to stimulate critical thinking (Commendador & Chi, 2013). Yet other studies focused on the learners' emotional (Taylor, 2011) or general reactions to an avatar's appearance (Jin's, 2010), and even if facial expressions had an effect on the learner (Sibuma, 2012).

Commendador and Chi (2013) successfully gained an understanding of e-learners' perspectives toward a learning modality that utilized patient case studies. What was unique about the case studies was that they involved avatars in a Baccalaureate level nursing education course. Commendador and Chi hypothesized that their perspectives would reflect positive experiences with the pre-clinical exposure, which was supported by the results.

In an effort to stimulate critical thinking, each avatar case study is embedded with a variety of questions pertaining to the respective pre-clinical case. After completing the pre-clinical trial, each student was asked to complete a set of questions regarding patient care, which also included basic demographic questions.

After analyzing 29 of the 30 distributed surveys, the quantitative data analysis demonstrated that the semantic differential instrument was reliable; in addition, the Chi-Square Data supported the hypothesis that the students would have a positive attitude toward this form of learning modality (Commendador & Chi, 2013). In addition, the learners also believed that this form of learning had cognitive benefits, as well as being an efficacious and cost-effective way to gain new knowledge. In regard to the independent variables (age, gender, year-in-college, grade point average, and self-rated computer literacy), the ANOVA data analysis did not support that the variety of variables had a significant impact on their feelings towards the avatar learning modality (Commendador & Chi, 2013). Once again, age and gender did not appear to have an effect on e-learning tools, which duplicated the results of Halawi, McCarthy, and Pires, (2009). Since neither of these studies included middle school participants, my study filled

the gap in determining if a student's grade level, as young as middle school was in fact a variable, which it was a factor.

Like the studies conducted by Kapralos (2011) and Lee and Lin (2013), this study did not test for learning, only for the participants' perspectives. Therefore, it was unknown if the learners' beliefs that the avatar helped them cognitively was actually accurate. However, in keeping with Vygotsky's (1978) social development theory, the fact that they had the opportunity to view a clinical scenario, although virtual, the actual experience of learning by experiencing should have produced new knowledge. According to the data, the authentic scenarios and videos embedded in the virtual course should have proven to be a positive experience for the learners in my study. However, the face-to-face course should have been more effective because the students were able to interact and be guided by a more knowledgeable adult, but they were not.

Commendador and Chi's (2013) study did supply the body of knowledge with additional support regarding a learner's perspective of the use of avatars in e-learning; however, this study was limited to nursing students and not middle school students. Additionally, the course was conducted synchronously with classroom instruction; therefore, it was unknown what effects the teaching component (the teacher, classroom conditions, and teaching tools) had on the opinions of the students. In addition, it was not a purely e-learning class; instead, the case studies were used as a supplemental learning tool. The authors utilized a semantic differential scale, which limited the participants by providing an answer only to eight specific questions. It would be very interesting to learn

what other perceptions the learners had regarding the avatars. Were there other topics that concerned the participants?

Falloon's (2010) interpretive research was regarding the perception of the level of engagement supported by avatars in a learning environment; however, this qualitative study had a more constructivist approach. Similar to Commendador and Chi (2013), Falloon also found evidence supporting the use of avatars to advance learning.

MARVIN is the name of the program, and it allowed students the ability to create and customize avatars in order to make multi-sensory presentations about a chosen topic. In an effort to seek users' perspectives of the software, Falloon's (2010) exploratory study includes a population sample from two intermediate schools in New Zealand. The total sample size was 1,069 participants. There were 578 students from one school and 417 from the second school; in addition, 49 and 25 staff members also participated (Falloon, 2010).

An assortment of data was collected from the staff and students. The staff completed pre- and post-intervention interviews and a survey; additionally, Falloon (2010) utilized video analysis of the teachers during their staff meetings, as well as information from student observations. As for the students, Falloon (2010) collected data from the following methods: video recordings of their working sessions, post-intervention interviews, and the actual video clips that were created by the students.

As a result of the triangulated data, Falloon (2010) concluded that it supported the hypothesis. More specifically, the interview data demonstrated that both the teachers and students were highly motivated and that the reluctant participants eventually became

engaged as a result of the program. Moreover, "students found working in the avatar-based environment provided them with a flexible and creative medium" (Falloon, 2010, p. 114). The sample population also commented that the ability of the software to allow for creating more customized avatars and backgrounds was one of the strengths of the program, in addition to allowing them a way to participate in presenting information, which was initially intimidating for some students. My study will help to supported the latter study. If this study was correct, the middle students in my study, especially shy students should have higher achievement scores due to the fact that they can ask questions and participate in online discussions without showing themselves.

The results of this study would lead one to believe that the more an avatar looks like the learner, the more engaged the learner would be? However, the participants were students and the software only allowed for presenting. Would the study have the same results if the participants were middle school students? What if in addition to the ability to change backgrounds, the middle school participants had the opportunity to have an avatar that also wore the same school uniform? Would the uniform add to their level of engagement or even increase their level of motivation? If the avatar could also present information to the learner, would the avatar be viewed as the more knowledgeable other, as described by Vygotsky?

Falloon's (2010) study demonstrated that some individuals preferred to customize their avatars and sometimes they were viewed as an extension of themselves, thus, making them less reluctant to present to an audience. Jin's (2010) research study took this notion a step further by studying an individual's perception of either their ideal avatar or

an avatar that looks like them in an interactive media environment. Additionally, how did the ideal or authentic avatar impact the individual's perception, behavior and attitude? The hypothesis stated, "game players who are primed to create a Mii that projects the ideal physical self will feel greater avatar–self connection than those players who are primed to create a Mii that reflects the actual physical self" (p. 568).

Jin (2010) compared two randomly assigned 76 undergraduate students from Boston College into two groups. The first group created a Mii from the Wii game that reflected their ideal physical self. The second group was primed to create a Mii that reflected their actual self. Afterwards, the participants were asked to complete a 7-point Likert scale, which was designed to measure their self-connection to their respective avatar. They also completed a 7-point differential scale, which provided the researcher with data on how the individuals perceived the physical attractiveness of their Mii. After analyzing the data, Jin concluded that the study provided enough support for the hypothesis. Thus, the participants that created a Mii that represented their ideal self, showed a higher level of avatar-self-connection than the group that created a Mii that reflected their actual self-image.

Did the male and female participants react differently to the respective avatars, tutors, or instructors? Could this have been due to identifying with their gender or even their hair, skin, or eye color? If in fact individuals prefer avatars that have more idealistic physical qualities, are avatars that are caricatures have a different effect on the learner's cognition as opposed to avatars that are represented by human photos?

Sibuma (2012) recognized the increased use of agents in the education sector; however, there was a lack of research on the effects of different types of agents had on the learner's cognition. As a result, Sibuma conducted a study in order to determine if a learner's interaction with an agent designed as a caricature, human, or photo of a person would change the learner's cognitive process.

The sample population included 25 adults with an average age of 29.6 years (Sibuma, 2012). The study design consisted of a two phase study; "both phases used a 3 (design: cartoon/agent/photo) x 2 (emotion: fear/neutral) factorial design with design and emotion as within-subject factors" (p. 352). Sibuma (2012) tested for decision making accuracy, reaction time, and face recognition memory.

Sibuma (2012) presented the participants with two types of facial expressions, either fear or neutral within three different avatar designs, which were either a cartoon, agent, or in the form of a photograph. The results of the study supported the hypothesis that the visual realism of the character faces would affect the learners' perceptions and decision-making (Sibuma, 2012). Actually, more accurate activity was recorded from participants when they were presented with faces in both neutral and fearful faces in form of photographs; in addition, that same form also elicited responses from the individuals that were not only more accurate, but also the fastest (Sibuma, 2012). Interestingly, the research stated that the faces that appeared as cartoons stimulated the highest scores for accuracy of facial recognition from memory. As for reaction time, it took the adults longer to respond to fearful faces and less time for neutral faces; however, the design of the avatar, whether a photograph, agent, or cartoon did not make a difference on the

variable of reaction time. Would my study support the results of this support regarding accuracy of facial recognition based on viewing an actual human online?

This study presented informative results for the future of avatar use in e-learning; however, live humans serving as avatars were not investigated. Although, Sibuma (2012) utilized photos of humans in this study, it still left the questions concerning the use of humans as avatars or guides. Would the participants have different cognitive and reaction times if the avatars were in motion? Additionally, only facial features were studied. Would it be logical to assume that if an avatar was used in full body form, it would have taken away from concentrating on the facial features? How could have learners perceived avatars that are in motion and are viewable in full body form? If more variables were added, would the results change?

Interestingly, Sibuma's (2012) research study demonstrated that an individual's cognitive process was more efficient if presented with photos instead of cartoon like avatars. However, Taylor's (2011) study focused on the variable of emotion. Similar to Sibuma's (2012) investigation, both studies utilized photos and caricatures as dependent variables.

Taylor (2011) realized that the current body of knowledge was lacking research in the area of how avatars affect an individual's emotional response in an asynchronous environment. Most studies revolved around synchronous online environments; however, this next study helped to fill that gap in the literature.

Websites such as Yahoo! Answers allow users to post and answer questions; in addition, users are given the option to use or not to use avatars in the form of a

photograph, object, or a cartoon. Taylor (2011) randomly selected a total of 132 questions

that would likely evoke emotional answers. A total of 881 answers to the questions were

also analyzed, and Taylor concluded that when a question was accompanied by an avatar,

it received more responses from other uses than questions that were posted without an

associated avatar (Taylor, 2011), which supported the second hypothesis. The analysis of

the answers to randomly chosen questions with and without avatars was checked for

evidence of concern, which also supported the first hypothesis, which stated that it would

be more likely that an individual would sympathize more if the avatar was static (Taylor,

2011). Thus, the study also demonstrated that not only did the avatar accompanied

questions receive more answers, the answers were more empathetic. Therefore, Taylor

(2011) recommended that, "sites that facilitate expressions of support for individuals

dealing with trauma, illness, or addiction, for example, may benefit from allowing users

to easily select and use an avatar" (p. 211). If choice is a factor, would programs that

allow the learner to choose their avatar's characteristics improve learning? The

participants in my study participated in Live Lessons, in which they engaged in online

discussions. Since they did not have avatars representing themselves, did this affect their

attitude towards their participation and learning?

   Taylor (2011) also conducted a second study to test the third hypothesis:

"Altruistic motives will be associated with a stronger preference for avatar-accompanied

questions" (p. 208). In other words, would an individual that is typically socially

motivated, be more helpful to others when there is an emotional link between the two

individuals? Taylor's analysis supported the third hypothesis, however, only for those

that posted questions accompanied with a cartoon-type avatar and not for a photographic avatar. This was in direct conflict with Sibuma's (2012) study, which emphasized better cognitive results with photographic avatars and not cartoon-like avatars.

It appeared that gaining a better understanding of the emotional connections between an avatar and a learner can be helpful to developers. In order to elicit the best possible learning environment, more studies are needed that investigate the perceptions of the learners in order to determine if there are more variables that affect their learning. How the different types of avatars affect the learner's cognitive process is also an important factor in creating the best possible e-course.

There was a study that investigated if utilizing avatars in a blended learning environment had an effect on an individual's cognitive and social presence (Omale, Hung, Luetkehans, & Cooke-Plagwitz, 2009). The exploratory case study had a small sample size, which were eight part-time graduate students.

The results demonstrated that the program did promote social presence; however, it did not help the participants to engage cognitively. In fact, the researchers reported that the avatars were a distraction to their learning. Could this have been attributed to the fact that the participants were between the ages of 30 and 50? If the students were in middle school, as in my study, would the results have been significantly different?

Similar to the other sections in this literature review, the topic of avatars was also poorly represented in the education sector. It is still unclear whether the use of avatars in educational settings, especially middle school environments could be beneficial to students' learning. Commendador and Chi's (2013) quantitative study did support the use

of avatars to increase student's attitudes towards learning, but his population was not my target population, and it was regarding their perspectives and not achievement data. Similarly, Fallon's (2010) study also supported the use of avatars, but this time to increase motivation. Like the previous study, Falloon's study did not produce achievement data like my study. Additionally, one study in this literature review shared opposite findings (Omale, Hung, Luetkehans, & Cooke-Plagwitz, 2009). As mentioned previously, almost all of these investigations supported the use of avatars in online learning for a variety of reasons, but my study focused on the students' achievement data.

According to Vygotsky (1978) theory, the avatars should prove to be an asset to online learning, especially in the virtual classes because it would be a representation of a person. Taylor's (2011) study also supported the use of avatars with pictures. Could this study support the notion that people need people to learn, or will a picture or animation suffice? If this is the case, Vygotsky's (1978) social development theory would be accurate.

Blended Learning

After searching the current body of knowledge regarding e-learning, blended learning was the fourth most common subtopic. Due to the fact that blended learning has two definitions, which includes either a class that is purely taken online with a virtual teacher or a course that just offers the option of online resources with a mix of face-to-face teaching, this review demonstrated that lack of studies that focus on the type of blended learning that my study focused on. The following studies extracted from the literature review on blended learning focused on academic achievement, student

perception, or student satisfaction. There were not enough studies that focused on the actual academic achievement of students utilizing the blended method as in my study. Similar to the studies in the other three categories, these investigations were regarding blended learning, and they were conducted with sample populations from higher education, one with high school students, but not younger students. Therefore, my study helped to fill the gap in the literature regarding blended learning and middle school students.

On the topic of student satisfaction in blended learning classrooms, Sucaromana (2013) conducted a comparative study. The respective study compared the satisfaction of university students that were enrolled randomly in either an experimental group (blended learning English class) or a control group (face-to-face English class). The students were separated by gender, as the researchers compared the target populations' intrinsic motivation, attitudes towards the subject, and the students' satisfaction with their respective learning climate. Each variable was tested before and after learning in the English class (Sucaromana, 2013). Unlike my study, this study lacked in the area of providing information about the students' actual academic achievement.

The results from the quantitative survey supplied the researcher with baseline data regarding information on the variety of variables from the sample population, which were Thai EFL students between the ages of 19 and 21. Sucaromana (2013) utilized Cronbach's alpha coefficient to assess the reliability of the questionnaires. The results were the following: "The students had significantly higher levels of intrinsic motivation

for learning English, a better attitude towards English as a subject, and better satisfaction with the learning climate after they were taught by blended learning" (p. 141).

The author stated that future studies should focus on investigating how blended learning could affect other variables, in addition to comparing this form of learning with other teaching methods in different subject areas (Sucaromana, 2013). My study helped to fill that gap because it included how blended learning, the type that includes purely virtual and purely face-to-face learning modalities, affected achievement while comparing grade levels. Unlike this study, which only focused on the blended learning that consisted of students sometimes utilizing online resources and the other times working with their face-to-face teacher on the same content. This blended learning model did not include an option of a virtual teacher.

During the same year, Baum (2013) conducted a study regarding blended learning, which included twenty-two undergraduate students. As Sucaromana (2013) recommended, this study was not based on an English course, instead it focused on the chemistry section of an undergraduate multidisciplinary science course.

The course followed a process oriented guided inquiry learning (POGIL) method, which followed Piaget's cognitive growth model. This method focused more on group work rather than lecture, and the teacher was more of a facilitator and less of a sage on the stage. The students were shown short presentations that were intended to familiarize them with new material and to engage them in their class work (Baum, 2013). Therefore,

the time in class is utilized for discussions about the concepts, testing, and for

application.

The data analysis included a t-test to compare examination scores over a seven-

year period. Unlike other studies (Yapici & Akbayin, 2012; Sucaromana, 2013; Zhang,

2012), Baum (2013) did not find that there was a significant difference between scores

for the students in the blended POGIL class to the class that only used the POGIL

method; however, the student engagement was much higher in the blended model. Since

the blended class time was reserved for complex tasks, the time in class was utilized more

efficiently (Baum, 2013). According to Vygotsky's (1978) social development theory,

students should be able to learn more with this collaborative method. Once again, this

form of blended learning was one that allowed students the advantages of a face-to-face

teacher and online coursework, not like my study that had two distinct learning

modalities in different courses.

The focus of this next longitudinal case study provided educators with more

information about blended learning in higher education. Similar to Baum's (2013) results,

Adam and Nel (2009) did not find support for the blended learning method. "Three case

studies each involved tracking a student evaluations of teaching (SET) measure

(willingness to recommend and grade point average for three subjects from the same

business discipline over six years" (p. 141). The difference between the three case studies

had to do with whether the student received their information simply from online media,

a blended approach of online and face-to-face, or mostly face-to-face.

The results of this study depended only on if the sample population would recommend the subject to another student. From that information, Adam and Nel (2009) concluded that no relationship was found between learning mode and grade point average. However, the researcher mentioned that the study did not control for the following variables: demographics, language proficiency, and prior computer literacy. On the other hand, the results from the third case study supported the notion that more face-to-face contact resulted in more satisfied students. They were mostly appreciative of the fact that they could return to those lectures and tutorials and replay them when needed.

Adam and Nel (2009) recommended that future studies be conducted with a sample population that is enrolled in a variety of subjects in order to provide varied perspectives of blended learning. My study included a sample population that was much younger than Baum's (2013) and Adam and Nel's (2009) target populations, and in addition they were enrolled in a variety of blended courses. Moreover, my data was based on academic achievement data and not the students' willingness to recommend this type of learning to others.

As suggested by the two previous researchers (Baum, 2013; Adam & Nel, 2009; Yapici & Akbayin, 2012), another study focused on blended learning in a Principles of Accounting class. The goal was to determine if the blended learning approach to learning would enhance student performance. Du (2011) compared a blended Principles of Accounting class with a traditional class in which all levels of university students were

required to take. Since both classes were taught by the same teacher that utilized the same

resources, this added to the validity of the study. The two hypothesis were:

> **Hypothesis 1:** A blended teaching model that incorporates online before-class and after-class activities directly improves the student final performance.

> **Hypothesis 2:** A blended teaching model that incorporates online before-class and after-class activities improves the student final performance through in class activities (Due, 2011, p. 3).

This study controlled for the following variables: math score, gender, prior GPA,

academic affiliation, transfer status, and academic level (Du, 2011). After analyzing the

data, the researchers concluded that the reason why the students improved was due to the

in-depth in class activities and not only because it was a blended learning model (Du,

2011). Could the results have been as a result of the students being more satisfied with

the interaction with the teacher and peers, and not necessarily the actual activities? Could

this be similar to Adam and Nel's (2009) study, in which the satisfaction rate was higher

in the face-to-face classes? Is it plausible that the positive results were due to the students

being more engaged students, similar to Baum's (2013) results? Was it really due to the

class activities, or were the results due to the personal engagement that was not readily

available in a purely online course? If the researchers surveyed the students about their

level of satisfaction of their peers, would there have been a correlation between that and

the achievement scores? My study was similar to Du's (2011) because the courses were

blended, had online delivery, and hands on activities. However, my study did not result in

higher scores in the purely face-to-face course. Unlike this study, my study compared two

distinct learning modalities, and not a combination of both, which was lacking in the

literature.

Part of Zhang & Han's (2012) study focused on gathering information about the target populations' attitudes and satisfaction towards two different learning approaches; they also compared these variables to the students' achievement scores. The data derived from questionnaires, and the results supported that the students' achievement scores were higher in the blended learning group. In addition, their attitudes were more positive towards the blended learning environment than the traditional classroom, which was similar to Yapici and Akbayin's (2012) study. For example, some of the participants shared that the blended learning model increased their self-confidence, and that they felt that they collaborated more with their classmates. Although they enjoyed the interactivity of the face-to-face portion of the class, they felt that the online activities gave them more opportunities to participate and collaborate with each other, which also afforded them numerous opportunities to practice communication skills virtually (Zhang, 2012), which was also supported in Ogunley's study (2010). The students also mentioned how they appreciated the flexibility, interactivity, and ability to self-pace their studies.

Adam and Nel (2009) shared the same perspective when they mentioned that students that engaged in more face-to-face time were more satisfied with the blended learning approach. Could the results of both of their studies be due to the sample population allowing them more time to build their confidence and mastery offline before they engaged with their peers face-to-face, thus making their face-to-face time more enjoyable?

It should be noted that the study conducted by Zhang & Han (2012) had a very small sample of a unique population of medical students. Although these students were college students similar to the other studies (Adam & Nel, 2009; Baum, 2013; Du, 2011; Sucaromana, 2013), was the study skewed in regard to IQ?

Although several studies about blended learning investigated the variables of student satisfaction (Adam & Nel, 2009; Baum, 2013; Sucaromana, 2013; Zhang, 2012) other researchers, such as Halawi, McCarthy, and Pires (2009) were more interested in if the mode of learning online was actually an effective method of learning. Their quantitative study actually supported online learning, and claimed that it was an effective method of teaching, and they made this claim based on their student population's scores.

In the specific category of blended learning environments, Sulcic and Lesjack (2009), like several other researchers (Halawi, McCarthy, & Pires, 2009; Lee & Lin, 2013; Sampong, 2009; Schuman et al., 2012; Wong & Huang, 2011; Yapici & Akbayin, 2012), also believed that online learning was effective but this time coupled with face-to-face learning, which is one definition of blended learning. In this respective study, data was collected from e-questionnaires and distributed to a target population of business students during course delivery and analyzed utilizing SPSS. Unlike my study, this one was conducted at a business college and not a middle school or even a high school like Yapici and Akbayin's (2012) study. More importantly these studies were not based on the definition of blended learning like my study was based on. In fact, all of the studies were based on blended learning, which was a combination of online learning and face-to-face

learning, and not based on a blended learning environment in which students tool purely virtual courses while also enrolled in other courses that are face-to-face.

Of the three theories tested, the first one regarding course delivery methods demonstrated support for blended learning. This particular finding supported the idea that a variety of teaching strategies were important to student success. Therefore, utilizing a blended approach was more successful due to the support that the students received on their weekly activities.

The second hypothesis regarding the amount of knowledge acquired by the students through a blended environment allowed the students to acquire more skills, such as computer, communication, and group work skills than students that only attend traditional classes. This is particularly true for students that were part-time students (Sulcic & Lesjack, 2009).

The researchers claimed that the third hypothesis was not proven, and that it was regarding the amount of time that students had with their face-to-face teachers. They claimed that the students that did not meet with their face-to-face teachers as much as other students did not learn as effectively as the other students (Sulcic & Lesjack, 2009). This finding was particularly important to my study because the students in this study did not receive face-to-face time with on-site teachers. Are blended courses effective because they have face-to-face time with their teachers, or because they are receiving guidance and support from a more knowledgeable other, even if it is virtual time? If Vygotsky's (1978) social development theory applies to blended learning, then the face-to-face

courses in my stud should have had higher achievement scores. Guidance from a virtual teacher is as effective as a face-to-face teacher, since they are also guiding a student. My study supports this statement.

As Sulcic and Lesjack (2009) suggested that a study like mine in which the grade level or subject area varied from their own study should be conducted to determine if the results differ. They concluded that this would be a worthwhile study because their investigation supported the notion that e-learning delivery had a positive effect on how much knowledge an individual acquires. My study helped to fill the gap that the current body of knowledge has regarding younger students and blended learning regarding courses that are purely virtual and face-to-face.

Another study that was interested in determining if blended learning environments had a positive effect on achievement is by Yapici and Akbayin (2012). Similar to my study, this one was also unique because the sample population did not consist of college students; it included students from the high school level. Moreover, it was based on a biology class, which gave the current body of knowledge a unique perspective on blended learning in a science classroom. In addition to the achievement scores, Yapici and Akbayin (2012) were also interested in learning if this blended learning model also had a correlation with the secondary students' attitudes toward the Internet.

The researchers prefaced the investigation by stating that the majority of the studies in the current body of literature support blended learning (Sucaromana, 2013; Sulcic & Lesjack, 2009; Yapici & Akbayin, 2012; Zhang & Han, 2012). The

methodology included a randomized pretest-posttest control group model, and the target population included 107 high school students from a school in Diyarbakir (Yapici & Akbayin, 2012). The experimental group, or the blended learning group, consisted of 47 students, while the control group had 60. The Biology Achievement Test was given to determine if the model had an effect on the students' scores, while the Internet Attitude Scale was used to determine if there was a change in the students' attitudes towards the Internet. According to the researchers, both topics were proven based on the data from the two tests. In other words, there was a significant correlation between the use of the blended learning model and the students' higher achievement scores and more positive attitude towards the Internet. This study was the most similar to my investigation. However, my study compared achievement scores for a younger population.

Another study was conducted in order to learn if a new ESS course book would be perceived in a positive manner by English language learners (ELL), and if they believed the online book was suitable for their English proficiency level and their diverse interests (Thang, Mustaffa, Wong, Noor, Mahmud, Latif, & Aziz, 2013). Additionally, the researchers were also interested in learning about what types of challenges and issues the university students experience while utilizing the online course book.

At the end of the school semester, the sample population, which consisted of 198 English students with varied English proficiency levels received a 35 item questionnaire, which consisted of a 4 point Likert scale (Thang et al., 2013). The researchers had an 81% response rate. The data revealed that the course book was well-received by both sets

of students; however, the higher performing group felt that the course book was more beneficial than the lower performing group (Thang et al., 2013).

Similar to the latter study, Ogunley's (2012) investigation also explored how the participants perceived the online course, but this blended course was called, First Class. In addition to their perspectives, they were also interested in learning if the course also helped to increase the students' levels of technology skills and if any of the resources in the course were useful in their respective places of employment (Ogunley, 2012).

The difference between the latter study and Thang et al.'s (2013) study was that it is only a month long, unlike other studies that were conducted throughout a semester or a school year (Adam & Nel, 2009; Baum, 2013; Sucaromana, 2013; Zhang & Han, 2012). The data from the 40 students were collected via an online questionnaire, which asked them about their backgrounds, while collecting their perspectives of the online course. For example, did they feel that the course helped them to increase their technology skills? Also, the questionnaire asked them to identify which resources from the online course they actually used in their current work place.

According to the results from the questionnaire, the authors concluded that the participants' occupations did not significantly contribute to their online learning, but that the variables, sex and age did have a positive effect on their learning (Ogunley, 2012). Unfortunately, the researchers do not divulge which gender benefitted the most from blended learning. Even though the study supported the idea that their current jobs did not contribute to their online learning, it did provide support that the program helped to

increase various forms of online skills like searching and information gathering. In addition, Ogunley (2010) concluded that the positive outcomes of online learning had to do with the face-to-face component because it provided the students time to collaborate, which allowed for more in-depth learning. Once again, the theme of collaboration (Adam & Nel, 2009; Baum, 2013; Du, 2011; Sulcic & Lesjack, 2009; Zhang, 2012).

Another study based on a college sample also focused on the learner's perspective of their online learning experience; this time, the sample only consisted of females from a nursing college. Since Ogunley (2010) reported that the variable of gender had an effect on the study, Hsu's (2011) study supported those findings, as well.

Hsu's (2011) survey design resulted in a common theme in which the participants were supportive of the blended learning environment; moreover, they reported that if they had face-to-face discussion extensions of the online gatherings the course would have been even more productive. Thus, 57.8% of the 99 students felt that the face-to-face discussions were more conducive to learning, and that the activities and overall learning environment were of high quality. One must keep in mind that the study only involved female participants from Taiwan, which could have been a limitation to the study (Hsu, 2011). Could this positive feeling towards blended learning be more prominent for women? Is there a difference between American and Taiwanese females regarding online learning?

For the topic of blended learning, the literature focused on three main themes: academic achievement, student perception, and student satisfaction. The majority of the

studies supported the use of blended learning (Baum, 2013; Du, 2011; Halawi, McCarthy & Pires, 2009; Hsu, 2011; Sucaromana, 2013; Sulcic & Lesjack, 2009; Yapici & Akbayin, 2012; Zhang & Han, 2012), but Adam & Nel, 2009 did not. They claimed that their study did not show a significant difference in the students' grade point averages. As the case with the other three themes in this literature review, the target populations were generally students from higher education, thus identifying a need for more studies regarding blended learning and the middle school child.

Summary and Conclusions

The four main topics that were described, analyzed, and synthesized in this literature review support e-learning as an effective way to learn (Halawi, McCarthy & Pires, 2009), and as a great way to train employees (Batalla-Busquets & Pacheco-Bernal, 2013; Lee & Lin, 2013; Sarmento, 2010; Schulman, Garcia, Wycoff, Duncan, Withum & Graygo, 2012). In addition, the second theme regarding the use of simulations in e-learning courses also surfaced in the literature review as a way to prove that e-learning is also an effective way for learners to receive authentic, safe (Kapralos, Hogan, Pribetic & Dubrowski, 2011; Lee & Lin, 2013), and efficient (Schulman, Garcia, Wycoff, Duncan, Withum & Graygo, 2012) practice in a variety of topics. This leads to the third theme regarding the use of avatars in online learning. The studies generally supported the use of avatars as enabling emotional connections between the learner and the course (Taylor, 2011), use as presentation tools (Falloon, 2010), and the impact of the avatars (Commendador & Chi, 2013; Falloon, 2010; Jin, 2010; Sibuma, 2012; Taylor, 2011). Lynch et al. (2011) also shared that the courses were more interesting if games are

incorporated. Omale, Hung, Luetkehans, and Cooke (2009) shared findings that did not support the use of avatars.

The literature review culminated with the incorporation of the latter themes and how they pertained to blended learning environments, mostly in higher education (Adam & Nel, 2009; Baum, 2013; Hsu, 2011; Sucaromana, 2013). The investigations revolved around comparing the face-to-face environments with online delivery. (Adam & Nel, 2009; Du, 2011; Sucaromana, 2013; Sulcic & Lesjak, 2009). Yapici and Akbayin (2012) supported the use of blended learning environments because they demonstrated an increase in academic achievement, while others were exploring student perspectives and affect towards blended learning (Hus, 2011; Ogunley, 2010; Thang et al., 2013; Zhang, 2012) in order to find support for the importance of the learner's experience and reaching learning outcomes.

Although, the current body of knowledge did appear to have a variety of research studies that mostly support blended learning, the majority of the studies were conducted in colleges or universities. More importantly, they revolved around one of the versions of blended learning, the one that includes a single course taught in a blended fashion. There was a lack of research that addressed the blended school model, which included students taking virtual courses along with courses taken face-to-face during the school day. Since more blended learning middle schools are being created, like the one in Maryland, it is important to conduct research with this age group and with this version of blended learning. Moreover, it is important that assumptions are not made that because e-courses are effective for adults that virtual courses are also effective for the younger middle

school child. My study focused on this target population, as well as provided data based on the middle school level.

There are several studies in the current literature that pertained to learning online; however, there was a gap regarding middle students learning in this manner. Therefore, this study gathered data in this area. A quantitative study was the best approach in order to compare middle school students by age.

Chapter 3: Research Method

Introduction

This nonexperimental quantitative study uniquely explored middle school students' achievement data after the sixth and seventh grade students completed both a face-to-face and virtual a course in a new blended learning environment. These courses were delivered online with the support of either a face-to-face or a virtual teacher. A retrospective causal-comparative research design was utilized because my goal was to investigate if there was a difference in scores between the younger students and the scores of the older students after completing virtual and face-to-face courses. The study was open to all 297 students in the sixth and seventh grades, which were enrolled in both face-to-face math and virtual social studies courses.

This chapter will include a detailed description of the research design and rationale, my role as the researcher, the methodology and measurement tools, procedures for recruitment and data analysis, participation, data collection, issues of trustworthiness, and ethical procedures.

Research Design and Rationale

This nonexperimental quantitative study compared the effects of course delivery (virtual and face-to-face) on academic achievement by comparing the average achievement score for a face-to-face math course with the average achievement score for a virtual social studies course after controlling for the students' ages. The research questions were: What is the difference in achievement scores between the 6th grade students participating in a virtual course as compared to the 6th grade students

participating in a face-to-face course? Is there a difference between the overall scores of the 6th grade students in the two respective courses as compared to the 7th grade students? A quantitative approach is appropriate because I am interested in gathering objective and numerical data and not depend on my own personal perspective or the participants' perceptions.

Quantitative designs can be categorized into four types: experimental, descriptive, quasi-experimental, and correlational. This study was not well suited for the experimental design because it did not have a control group, thus the students' ages (independent variable) were not under my control.

A correlational design can demonstrate that there is a relationship between two variables, but it cannot show if one variable caused the other. There are many similarities between correlational and causal-comparative research design. However, a correlational design is not appropriate for this study because I was not studying the extent of the independent variable had on the dependent variable like a correlational design. Also, I determined the cause for the preexisting differences between the two groups. In addition, they were variables that I could not manipulate or control. In a correlational design, the researcher was looking for the degree to which two or more variables are statistically associated.

I also considered a descriptive approach to my research; however, I did not to collect data from measurement tools such as researcher observations or interviews with the participants. I was not looking to describe the existing environments. Instead, I

utilized only the academic achievement data for each grade level from the two courses that they were enrolled.

A quasi-experimental design was not appropriate for this study because the students already experienced the courses. For a quasi-experimental design, I would have had to collect the data during the research study. I extracted the data from an existing database.

My study focused on collecting interval data in order to determine if there were differences between the two groups, face-to-face and virtual. After analyzing the data with the assistance of SPSS, a statistical software program, I have unbiased numerical data to determine my findings.

This quantitative study was confined to a specific geographical location because all of the students had to live in a specific county to attend this charter school. The respective school consisted of 197 students that came from 124 different schools; as a result, the demographics were diverse.

Since I am the principal of this charter school, I obtained permission from Prince George's County Public School System's IRB department to conduct the study. Since students are a protected class, I had to have consent from Prince George's County Public School System (PGCPS) and the students' parents or guardians. Once I received permission from the school system and the parents or guardians, I asked Connections Education, the company that stores our student data, to pull the students' overall scores from their mathematics and social studies courses for a semester. PGCPS emailed the parents and guardians about the study and asked for their permission to allow me access

to their student's data for this study. PGCPS emailed the parents the consent forms and they returned them electronically to the PGCPS IRB office for collection. If they did not choose to participate, I did not utilize that student's data.

Role of the Researcher

For this quantitative study, I took the role of a nonparticipant for the data collection part of the study. The initial data collection process was extracted from the internal web portal, after the participants completed their courses on-site and virtually. Although, I had access to the participants while they completed the courses, I did not engage with them during their respective classes. Furthermore, the data was extracted from the web portal once school ended, and I stored the data utilizing SPSS.

Methodology

Participant Selection Logic

The participants consisted of a sample population of sixth and seventh grade students that completed a virtual and a face-to-face course to advance their work-related knowledge. In this regard, as Creswell (2007) recommended, the participants will share the phenomenon, which will include both the online and face-to-face courses. The data will be collected from the average test scores from all of the students that completed the courses.

I had email addresses for 297 of the students from the first school year. Once I received the data, I coded the students with a number one, two, three, and four. I also assigned each learner (study participant) a number in order to ensure anonymity during data analysis. Utilizing aliases for the participants protected their anonymity. Any

personal information that was learned during the study was kept confidential and secured by abiding by the ethical code for researchers. The data were collected and stored within the school's online portal, which was backed up by the online company that provided the school's curriculum. A backup file and the coded file were also kept on an external hard drive, which was secured in a safe. After the data was analyzed, it was utilized to answer the research questions.

Instrumentation

Data was collected from the following sources: the sixth and seventh grade achievement data from their unit exams for the semester for their respective social studies courses, and the same data for the sixth and seventh grade for the math courses. These figures were collected and stored within the school's online portal, which was backed up by the online company that provided the school's curriculum. The back-up file was also added to an external hard drive and secured in a safe. The data were extracted directly from the company's database, and I coded it utilizing SPSS. After analyzing the data, I utilized it to answer the research questions.

The goal in this data collection process was to obtain average numerical data for both groups, the students that completed a virtual social studies class and the students that completed a face-to-face mathematics class. As the researcher, I had access to clear numerical data, learning modality, and grade level.

Procedures for Recruitment, Participation, and Data Collection

After receiving approval from the Walden University IRB, and the Prince George's County Public School's IRB, the PGCPS IRB emailed a short synopsis of the

research study to the parents and guardians of all of the sixth and seventh grade students,

and asked them to respond via email. After their responses were received, they received a

response thanking them for their participation. If they elected to allow their child's datum

to be utilized in the study, they were then asked to complete an electronic informed

consent form (See Appendix A). Once four waves of letters were sent out within a 30-day

period, the data was released and I coded the data and analyzed it.

Once consent forms were signed, the researcher assigned each participant a

number in order to ensure confidentiality during data analysis. Any personal information

that was learned during the study was kept confidential and secured by abiding by the

ethical code for researchers. The database did not include much personal data; it included

each student's first name, last name, course name, assessment scores, student's grade,

and student's gender.

The data were collected from Connections Education's web portal at the end of

the semester. This company stored the students' assessments and overall scores on a

secure web portal. The data were stored and organized in document files within the SPSS

software.

I extracted the unit assessment scores from the two respective courses from the

spreadsheet retrieved from Connections Education. I averaged the unit exams for each

student. I compared the averages of the students that completed the virtual course to the

averages of the students that took the face-to-face mathematics course. The results

allowed me to answer the following research questions: What is the difference in

achievement scores between the 6th grade students participating in a virtual course as

compared to the 6th grade students participating in a face-to-face course? Is there a difference between the overall scores of the 6th grade students in the two respective courses as compared to the 7th grade students?

Data Analysis Plan

The SPSS software program enabled me to easily store, code, and analyze the data. Although the software was very helpful, the analysis was time consuming. The results allowed me to answer the research questions.

Data Collected:

- The average score for the sixth grade students after completing the face-to-face math course;

- The average score for the sixth grade students after completing the virtual social studies course;

- The average score for the seventh grade students after completing the face-to-face math course;

- The average score for the seventh grade students after completing the face-to-face math course;

- Gender; and

- The students' grade level.

Issues of Trustworthiness

The achievement data gathered came from Connection Education's web portal, which was directly linked to the students' grade books. The students' grades on the database came directly from their assessments, which were taken online and were the

same for all students. The grading was done automatically by the computer program, thus, increasing reliability.

The sample population came from a large school system, Prince George's County Public Schools; therefore, the students came from only that county. However, since Prince George's County is so large, the student population for the school was from a variety of socio-economic backgrounds. Therefore, the study was generalized in that area, but not by diversity. The student population is majority black, thus, making generalizability more difficult.

Ethical Procedures

I followed Creswell's (2007) advice to follow ethical procedures by "seeking consent, avoiding the conundrum of deception, maintaining confidentiality, and protecting the participants" (p. 44).

I was the only individual to utilize student data with the proper permission forms from their parents or guardians. I kept all student data within the SPSS software and secured. Once the study was completed, I destroyed the data collected.

Although, I am the principal of the school, I did not have access to grading the students' assessments or the ability to change the students' grades within the Connexus web portal by Connections Education. I had Connections Education extract the report that included their unit assessment scores directly from their database in order to increase the validity of the study. Also, I did not utilize any incentives during this study for teachers, students, parents, or guardians.

I followed the proper protocol and asked for permission to utilize the participants' data from PGCPS's IRB and permission was granted (See Attachment C). As a result, Walden University's IRB gave me permission to conduct the study (See Attachment D).

Summary

This chapter included a robust description of the research design and rationale, my role as the researcher, the methodology and measurement tools, procedures for recruitment, data collection and analysis, issues of trustworthiness, and ethical procedures.

As discussed in this section, the study was a nonexperimental quantitative study with a retrospective causal-comparative research design. The rationale for this decision included explaining my desire to obtain achievement data that could be compared by virtual and face-to-face groups, as well as by the students' ages. Moreover, I wanted to play the role of a nonparticipant researcher in order to ensure more valid data.

The methodology of the study was described in detail. All students in the school were invited to participate in the study; therefore, I randomized the sample once permission was received and the subjects were coded. The instrumentation that was used was valid and reliable because the courses were accredited and utilized by Connections Education in many schools, and the grades came directly from the students' assessments.

The methodology described above should produce ample numerical data in order to answer the following research question: What is the difference in achievement scores between the 6th grade students participating in a virtual course as compared to the 6th grade students participating in a face-to-face course? Is there a difference between the

overall scores of the 6th grade students in the two respective courses as compared to the

7th grade students?

Chapter 4: Results

Introduction

The purpose of this nonexperimental quantitative study with a retrospective causal-comparative research design was to find quantitative data to determine the effectiveness of virtual and face-to-face courses in sixth grade as compared to seventh grade. More broadly, the study contributed additional data to the current body of knowledge related to blended learning as a viable option for middle school students.

The research questions were: What is the difference in achievement scores between the 6th grade students participating in a virtual course as compared to the 6th grade students participating in a face-to-face course? Is there a difference between the overall scores of the 6th grade students in the two respective courses as compared to the 7th grade students?

The fourth chapter will present the setting and the population's demographics and characteristics relevant to the study. This section will also include a detailed explanation of the data collection process and how the data was analyzed. Additionally, the chapter will include a more detailed explanation of the evidence of validity and the study's results, as they pertain to the research questions.

Setting

The data that was utilized in this study derived from the actual scores that the 6th and 7th grade students earned from their unit assessments in both their virtual social studies and their face-to-face math classes. The unit assessments were given as part of the

normal semester's curriculum; therefore, the setting was not influenced by this casual comparative study.

Demographics

All students in the study were either in sixth grade or seventh grade. They all lived in Prince George's County. The study population in this study came from one county, because they only qualified to attend this charter school if they lived in Prince George's County. Out of Prince George's County's student population, only 297 students were registered at this respective charter school during the 2013-2014 school year. Of the 297 students, 65 parents and guardians consented to allowing their child's achievement scores to be utilized for this study. Therefore, the study sample included 65 full-time students. The study sample included students in sixth and seventh grade and ranged from 10 to 12 years old. The gender distribution of the study sample was 33 males and 32 females. Furthermore, the participants included 35 students in 6th grade or 53.8% ad 30 students in the 7th grade or 46.2% of the total sample population.

Data Collection

I requested data for sixth and seventh grade students that completed a virtual social studies course and a face-to-face mathematics course at a blended learning middle school. Once I received the IRB approval from PGCPS's IRB, Dr. Kola K. Sunmonu, Ph.D., Director of Research and Evaluation for PGCPS explained that he will only commit to 30 days of data collection. Furthermore, the email solicitation will be sent out in four waves, once per week. The actual recruitment began on November 2, 2015, when the first wave of email solicitations for my study was sent via electronic mail. As a result

of the first attempt to gain approval from the parents and guardians, 24 valid active

consent forms were received. This represented approximately 8% of the 297 emails that

were sent. On November 11, 2015, the second wave of the email solicitation for my

research study was sent. As a result of the second wave, 14 more parents had consented

to have their children's data included in my research. Overall, 12.8% of parents had

consented at this time. On November 16, 2015, the third wave of the email solicitation

went out, which resulted in 56 parents granting permission for their children's data to be

released. This number represented approximately 19% of the 297 solicitations made. On

November 24, 2015, the final reminder emails were sent out. On December 14, 2015, the

PGCPS IRB Department released the file that contained the data for students whose

parents granted permission. Overall, 65 or approximately 22% of the 297 surveyed

parents and guardians authorized the release of their child's records to me.

 Dr. Kola K. Sunmonu, Ph.D., Director of Research and Evaluation for PGCPS

explained that he removed any student data that did not receive consent from their parent

or guardian. Once that was completed, he sent the data to me via email.

 Although, there was no variation or unusual circumstances in the data collection

from the plan that was presented in chapter 3, the sample size was not as high as

expected.

 The data collection in this study included two univariate analyses. One for each of

the two independent variables/fixed factors: student grade level (6th or 7th grades) and

course delivery method (virtual or face-to-face).

The ANOVA compared the 6th grade students' average assessment scores by course delivery method. The two course delivery methods were also compared to each other by grade level.

Data Analysis

Once I received the data, I randomized the sample population by coding the students with either a number one, two, three, or four. I then grouped the students by their respective numbers and sorted them as evenly as possible. I also assigned each learner (study participant) a number in order to ensure anonymity during data analysis. Additionally, each student's gender was coded with a one for male and two for female, and their grade level was either coded with a one for 6th grade and 7th grade students received a number two. After the average test scores and demographic data from all of the students were analyzed, the data was utilized to answer the research questions.

The data were collected from Connections Education's web portal at the end of the semester. This company stored the students' assessments and overall scores on a secure web portal. The data were stored and organized in document files within the SPSS software.

The SPSS software program enabled me to easily store, code, and analyze the data. Although the software was very helpful, the analysis was time consuming. The results allowed me to answer the research questions.

Data Collected:

- The average score for the sixth grade students after completing the face-to-face math course;

- The average score for the sixth grade students after completing the virtual social studies course;

- The average score for the seventh grade students after completing the face-to-face math course;

- The average score for the seventh grade students after completing the face-to-face math course;

- The students' grade level; and

- Gender.

Table 1 summarizes the data sources, collection, and the analysis methods that I utilized to answer the research questions.

Table 1

Research Questions, Data Sources, Collection, and Analysis Methods

Research Questions	Data Sources	Data	Method of Analysis

RQ1: What is the difference in achievement scores between the sixth grade students participating in a virtual course as compared to the sixth grade students participating in a face-to-face course?	• Connexus Report	• 6th grade Average score for face-to-face math course • 6th grade Average score for virtual social studies course	• Quantitative Analysis • ANOVA
RQ2: What is the difference between the overall scores of the sixth grade students in the two respective courses as compared to the seventh grade students?		• 6th grade Average score for face-to-face math course • 6th grade Average score for virtual social studies course • 7th grade Average score for face-to-face math course • 7th grade Average score for virtual social studies course • Students' grade level	• Quantitative Analysis • ANOVA

Results and Summary

I conducted an ANOVA with a variety of data points I collected, which included

the sample size by grade level (see Table 2) and gender (see Table 3). The data allowed

me to answer the two research questions. The results are provided below and divided by

research question.

Table 2

Sample Population Size by Grade Level

Grade	N	%
6th Grade	35	53.84
7th Grade	30	46.15
Total	65	100.00

Table 3

Sample Population by Gender

Gender	N	%
Female	32	49.23
Male	33	50.77
Total	65	100.00

RQ1: What is the difference in achievement scores between the sixth grade

students participating in a virtual course as compared to the sixth grade students

participating in a face-to-face course?

The 6th grade students completed a face-to-face math course and a virtual social studies course. Of the total 6th grade sample, 35 students earned a higher overall average on the virtual social studies course (86%) as compared to the average score for the face-to-face course (76%) (see Table 4).

Table 4

The 6th Grade Mean Average and Standard Deviation by Delivery Method

Delivery	N	Mean	S.D.
Face-to-Face	35	75.96	12.29
Virtual	35	85.53	10.32

Table 5

One Way ANOVA for 6th Grade Face-to-Face Course

6th Grade	Sum of Squares	df	Virtual Av.	F	Sig.
Between Groups	250.22	1	75.96	1.99	.164
Within Groups	7937.51	63			

Table 6

One Way ANOVA for 6th Grade Virtual Course

6th Grade	Sum of Squares	df	Virtual Av.	F	Sig.

Between Groups	2234.76	1	85.53	18.58	.000
Within Groups	7578.21	63			

RQ2: What is the difference between the overall scores of the sixth grade students in the two respective courses as compared to the seventh grade students?

The results in Table 7 demonstrate that the 6th grade students scored higher (76%) on the face-to-face math course than the 7th grade students (72%). The 6th grade students also scored higher in the virtual social studies course (86%) than the 7th grade students (74%) (see Table 8).

Table 7

Descriptive: Face-to-Face Mean Scores and Standard Deviation by Grade Level

Grade	N	Mean	S.D.
6th Grade	35	75.96	12.28
7th Grade	30	72.02	9.83
Total	65	74.14	11.31

Table 8

Descriptive: Virtual Mean Scores and Standard Deviation by Grade Level

Grade	N	Mean	S.D.
6th Grade	35	85.53	10.31
7th Grade	30	73.77	11.68

| Total | 65 | 80.10 | 12.38 |

Table 9

One Way ANOVA for 6th and 7th Grade Virtual Courses

Virtual Courses	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2234.76	1	2234.76	18.58	.00
Within Groups	7578.21	63	120.29		

Table 10

One Way ANOVA for 6th and 7th Grade Face-to-Face Courses

Face-to-Face Courses	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	250.22	1	250.22	1.99	.16
Within Groups	7937.51	63	125.99		

Overall, the 6th grade students earned higher overall scores than the 7th grade students in both delivery methods (see Table 11). Furthermore, both grade levels scored higher in the virtual category (see Table 11).

Table 11

A Comparison of Achievement Scores by Delivery Method and Grade Level

Grade	Face-to-Face Average Score	Virtual Average Score
6th Grade	76%	85.53
7th Grade	72%	74%

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

This chapter includes an overview of the problem statement, purpose of the study, the research questions, review of the method of study, findings, interpretations of findings, limitations, and the implications for social change. The conclusion of the chapter includes a list of recommendations for future research in blended learning.

Problem Statement

The current body of knowledge supports the use of e-learning; however, there is a lack of research based on middle schools. Furthermore, there are no studies that investigated middle school students' achievement data from face-to-face and virtual courses in a blended learning environment.

Although the current body of knowledge includes studies that compared achievement scores with learning mode (Adam & Nel, 2009; Baum, 2013; Sucaronmana, 2013; Sulcic & Lesjack, 2009; Ogunley, 2010), they were all based on adult sample populations. Middle school students are more likely to lack self-motivation to attend school than adults. In addition, there are other investigations that have explored blended learning efficiency (Baum, 2013) and attitudes towards blending learning (Hsu, 2011; Thang, Mustaffa, Wong, Noor, Mahmud, Latif, & Aziz, 2013; Yapici & Akbayn, 2012; Zhang & Han 2012). The majority of the studies reported that the participants were supportive of the blended learning environment, but they also had a choice. For the school being analyzed in the study, the students did not have a choice between virtual and face-to-face learning modalities. All sixth and seventh grade students during this school's

first year open were required to take a virtual social studies class and a face-to-face math class.

Overall, this quantitative study was needed because organizations continue to develop more bricks and clicks middle schools. In fact, another blended learning middle school is under construction in the United States, the two respective school districts and the e-learning companies do not have aggregate data to support whether this is an effective method of teaching.

Purpose of the Study

The purpose of this nonexperimental quantitative study was to analyze sixth and seventh grade middle school students' achievement scores after completing both a virtual and a face-to-face course. I was seeking an enhanced understanding of the effectiveness of each course delivery method by comparing the average achievement score by course delivery method and again by grade level. The results of this study were shared with the leaders of the school and the course software developers. More broadly, the study will contribute additional data to the current body of knowledge related to blended learning as a viable option for middle school students.

Research Questions

The research questions for this study were: What is the difference in achievement scores between the sixth grade students participating in a virtual course as compared to the sixth grade students participating in a face-to-face course? Is there a difference between the overall scores of the sixth grade students in the two respective courses as compared to the seventh grade students?

Review of the Method

The study was a nonexperimental quantitative study with a retrospective causal-comparative research design. All students in the school were invited to participate in the study; therefore, the subjects were coded. The instrumentation that was used was valid and reliable because the courses were accredited and utilized by Connections Education in many schools, and the grades came directly from the students' assessments.

Summary of the Findings

The methodology described above produced ample numerical data in order to answer the research questions. The data collected included each student's average score in each course and grade level of each student.

More specifically, Table 4 displays a comparison between the average scores of all sixth grade students after completing a virtual social studies course and again for the face-to-face math course. As the table demonstrates, the sixth grade students earned a higher average score for the virtual course.

Table 5 compares sixth grade students' achievement scores for both the virtual and face-to-face courses as compared to the seventh grade students in the two respective courses. The results indicate that the sixth grade students scored higher in both types of courses than the seventh grade students; thus, supporting virtual learning over face-to-face learning.

Interpretation of the Findings

The majority of the studies discussed in the literature review did not include middle school students because they were conducted in institutions of higher education.

They also occurred in schools that were conducted in blended learning that included a single course taught in a blended manner, which is only one form of blended learning. It was evident that there was a shortage of research regarding blended school models that encompassed students taking virtual and face-to-face courses during a typical school day.

Several of the studies that were described, analyzed, and synthesized in this literature review supported e-learning as an effective way to learn (Halawi, McCarthy & Pires, 2009), and as a great way to train employees (Batalla-Busquets & Pacheco-Bernal, 2013; Lee & Lin, 2013; Sarmento, 2010; Schulman, Garcia, Wycoff, Duncan, Withum & Graygo, 2012). Similar to these studies, my study also found that the highest overall scores for both grade levels were earned in the sixth and seventh grade virtual courses, thus supporting the current body of knowledge.

The virtual courses that my sample population experienced utilized extensive simulations and interactive videos. There were several studies cited in the literature review that also supported the use of activities such as simulations as a way to effectively teach students in a safe (Kapralos, Hogan, Pribetic & Dubrowski, 2011; Lee & Lin, 2013), and efficient (Schulman, Garcia, Wycoff, Duncan, Withum & Graygo, 2012) manner. It would be beneficial if future studies would focus on if a variable, such as interactive videos are more effective because students can review at their own pace.

Many studies in the literature review supported the use of blended learning environments (Adam & Nel, 2009; Baum, 2013; Hsu, 2011; Sucaromana, 2013), such as the one in my study; however, they did not pertain to middle school populations. Other studies specifically compared virtual to face-to-face environments (Adam & Nel, 2009;

Du, 2011; Sucaromana, 2013; Sulcic & Lesjak, 2009), and they all resulted in positive outcomes towards virtual learning, similar to the results of my study. Yapici and Akbayin's (2012) study was most similar to my study because they demonstrated an increase in academic achievement, thus supporting blended learning.

My study supported virtual learning; however, I believe that the current body of knowledge would benefit from a follow up study that explores student's perspectives and their affect toward blended learning, similar to the studies conducted by Hus, 2011; Ogunley, 2010; Thang et al., 2013; Zhang, 2012.

The results of my study support Lev Vygotsky's (1978) social development theory and Jean Piaget's constructivist theory of knowledge, because both theories put emphasis on the importance of dynamic and customized learning.

The virtual social studies course that the sixth and seventh grade students completed incorporated authentic learning through interactive activities and live lessons with a virtual teacher and support of a success coach. This mode of learning is similar to Vygotsky's (1978) theory because it incorporates a coach and authentic experiences.

In the virtual learning environment, the middle school students were required to introduce themselves to concepts and sometimes grapple with the content on their own. Although they were supported by a success coach, they typically had to problem solve on their own compared to when they were in face-to-face courses with a content expert, who had the responsibility of introducing the students to new ideas. The constructivist theory of knowledge also emphasizes the notion that students need to engage in active learning in order to learn new ideas (Piaget, 1970).

Limitations of the Study

As described in chapter 1 for the proposal, the achievement scores were computer generated and came directly from Connection Education's web portal, which increased the reliability. In addition, the sample population came from only Prince George's County, which limited the generalizability. Prince George's County has a significantly high number of black students, and it is unknown if the final sample population also mimicked the majority black population.

Recommendations

Describe recommendations for further research that are grounded in the strengths and limitations of the current study as well as the literature reviewed in chapter 2.

This study supported the virtual learning modality; however, a follow-up study would help to strengthen the validity of the study. Therefore, I recommend repeating the study with the sixth and seventh grade students that attended the school after the first school year. More specifically, conduct the study utilizing the data from the 2014-2015 and the 2015-2016 school years. This could either reinforce this study's results or help disconfirm the study.

I also recommend that a second study including longitudinal data be conducted. This study's sample population should include the students that have attended this blended learning school for two or more years. It would be interesting to utilize experience in a blended learning school as a covariate. Does experience make a difference and help to increase their scores in the future and their perception of online learning? According to Dobbs, Waid, and del Carmen (2009), their study supports the

idea that just having experience taking an online score changes a student's perception in support of online learning.

Implications

The potential impact for positive social change from this study is significant. On an individual level, online course developers and school leaders can feel more confident in their support of opening more middle level blended learning schools. In addition, organizations such as Prince George's County Public School System can feel confident in approving future charter schools with this same model.

As the only blended learning school in PGCPS, some families hesitated to enroll their students in the school, while others took a chance by registering their scholar at the school. Just like with any school that doesn't have a history, some parents and guardians were unsure of the effectiveness of the model. Since there is a gap in research regarding virtual learning and middle school student's achievement scores, this study should help families feel more secure in their choice, as well as help prospective parents decide whether to enroll their child in future years.

As a result of this study, I recommend that the school's executive board continue with their plans to open more blended schools in the respective county. This would allow students from further areas of the county to benefit from the blended learning model.

The virtual portion of this school is only half of the model, one that can easily be replicated and inserted into an existing program. Now that I have data that supports virtual learning, I recommend that other schools consider the virtual option in their traditional programs, as another option. Due to the flexibility that virtual learning

provides, and the easy access to offer a class for just one student, it would give students more options than what the school can currently offer.

Conclusion

Since more blended learning middle schools are being created, like the one in Maryland, it was important to conduct research with this age group and with this version of blended learning. Since there was a lack of research regarding a younger population, only assumptions could be made that virtual courses can also be effective for younger students. There is now a study in the current body of knowledge that supports the notion that virtual courses are more effective for sixth grade and seventh grade students. Individuals, school based leaders, and organizations can feel more confident in the effectiveness of virtual learning with the support of adults that help to facilitate in their learning.

In addition to feeling more confident that students are learning, the stakeholders can also be comforted by the fact that students can have more choices in courses because schools can offer students more options by purchasing courses per student without the extra expense of hiring on-site staff.

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