CONNECTED IN ISOLATION:

A CORRELATIONAL STUDY OF STUDENTS' SENSE

OF CONNECTEDNESS IN AN ONLINE COURSE

AND THEIR LEARNING OUTCOMES

by

Ben Allen Morrell Jr.

Liberty University

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A Dissertation Presented in Partial Fulfillment
of the Requirements for the Degree
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ABSTRACT

The purpose of this quantitative, bivariate correlational study is to understand the relationship between online high school students' sense of connectedness in the course, as measured by the Online Student Connectedness Survey (OSCS) and the students' standardized End of Course (EOC) Milestone scores. A review of literature revealed a lack of research on high school students and their perception of connection in their online course as it relates to their academic success. The independent variable for the study is the students' sense of connectedness score as derived from the Online Student Connectedness Score (OSCS). The dependent variable for the study is the students' standardized achievement scores as measured by Georgia Department of EOC Milestone Assessment Score. This research study was conducted using a non-experimental bivariate correlational research design. The data analysis chosen to evaluate this research study is the Pearson Product Moment Correlation Coefficient, also known as Pearson's correlation or Pearson's r. Pearson's r was calculated to help analyze data for the Research Question. A Bivariate Scatterplot was created to visually analyze the data from the study. The Pearson's product-moment correlation (Pearson's r) revealed no statistical significance was found in the correlated values of EOC and OSCS scores. Thus, a statistically significant correlation was not found between the high school students' sense of connectedness in their online course and the EOC Milestone Assessment test scores taken at the completion of the course. Future research on this topic is recommended and should include a larger sample population to help generalize the study for future research.

Keywords: zone of proximal development (ZPD), asynchronous learning, synchronous learning, online learning, connectedness

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It is great to get to the end of this program, but like the saying goes, "it's not about the destination, it's about the journey and the experiences you have while working toward that destination". Looking forward now to new and exciting experiences in my educational journey.

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County Virtual Academy (CVA)

End of Course Milestone Assessment (EOC)

Georgia Department of Education (GADOE)

Online Student Connectedness Survey (OSCS)

Zone of Proximal Development (ZPD)

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CHAPTER ONE: INTRODUCTION

Background

In 1981, the United States government took a stand on the current status of the public education experience for students. "A Nation at Risk" was a report created by the National Commission on Excellence in Education. The report found that the curriculum at the secondary school level in the country was not challenging to the level of not improving the education of our high school students. The report shifted the educational focus in the United States to core academic courses and standardized testing, where students could be compared to one another. Christensen, Horn, and Johnson (2011) explain the report results with the analogy of "in effect, we have a cafeteria-style curriculum in which the appetizers and desserts can easily be mistaken for the main courses" (p. 59).

The standardization of education was accelerated by the report, "A Nation at Risk" (Horn & Staker, 2015). The report began the push towards classroom experiences for students that were less about the individual learner and more about getting through the standards of the course and acquiring a test score. This report led to educational hysteria in the United States, along with the perception that the current system was broken and must be changed if American students were to keep up with their counterparts in other foreign countries (Christensen et al., 2011).

This educational hysteria, and the need to compare American students with each other and with students in other countries, began the standardization of educational experience for public school students in Kindergarten through 12th grade in the United States. The problem with students being pushed through their educational journey in a factory style classroom experience is obvious. Horn and Staker (2015) believe that all students have different aptitudes and background knowledge. These different experiences affect the way and timeframe in which

students learn information. Students are all individuals who learn at different paces and in different ways. When schools require all students to learn everything at the same time, and in the same way, the system is doing students a disservice.

The accountability piece of education has grown so dramatically in recent years, to the point where testing and data drive the curriculum. Assessment has become the driving factor in the current realm of education, and schools are spending more time assessing skills through standardized tests and less time preparing students for the current diverse and online workplace they will soon enter (Lichtman, 2014). American students' educational experiences have become teacher and test focused. Students are expected to move through the curriculum at the same time in order to pass a standardized test at the end of the course that may or may not be relevant to what they need to know for success in the real world. Horn and Staker (2015) report that today's job market requires knowledge workers in over 60 percent new positions. These knowledge workers will need skills, which are not memorized and used over and over again like the factory workers of the past. Today's student must be able to collaborate with peers, work through real-world problems, and use technology to innovate and become problem solvers, not become masters of multiple-choice exams.

The traditional, industrial age model of an education assembly line keeps students in courses and grade levels in an assembly line concept. Schools feel the pressure to move students through the curriculum at the same pace in order to expose them to as much curriculum as possible prior to taking the standardized test at the end of the course. A teacher's ability to differentiate for individual student's needs has taken a backseat to getting through the standards of the course in a certain period of time. The past model of standardization and batching students together based on age is changing to a culture of flexibility and self-pacing with the

online options available today for students. (Horn & Staker, 2015).

Technology and educational innovation is helping to change the concept of time in a course and the teacher's ability to differentiate for students and still progress through the curriculum of the course in a timely manner. Lichtman (2014) believes "we can't create more minutes in a day or days, but we can absolutely twist time to better our learning goals" (p. 21). The creation of student-centered, project based learning opportunities that incorporate technology or are totally provided online is disrupting education in today's classrooms (Christensen et al., 2011).

It is imperative for our K-12 educational institutions to understand the impact online learning is having across not only the United States, but also the entire world. Friedman and Friedman (2011) suggest offering online courses to students as a cost effective way for schools ranging from kindergarten through graduate school to offer more courses and opportunities for students that was never possible in the past. Luehr (2011) believes that online learning cannot be considered a trend in education and that it should be taken seriously as a main method to educate students as we look for more options to differentiate for all student needs and learning preferences.

The student-centered instructional model has been shown to increase student engagement while allowing students to become more active participants in the learning process (Kurvitis & Kurvitis, 2013). Virtual and online learning opportunities allow students to be active participants in their instruction as teachers assume more of a facilitator role. Christensen et al. (2011) note that new online options are arising to serve a student population that was not satisfied with the traditional public school setting and educators have to make a choice as to how these new mediums will affect their instructional beliefs. It is imperative for educators to realize the

potential online learning has for creating student-centered learning opportunities for students where engagement, collaboration, and pace can all be addressed to improve student achievement.

Historical Significance

The Industrial Age of education is quickly coming to a close with the disruptive influence of technology and the Internet in today's classrooms. Educational research shows that students all learn at different paces based on their ability levels, interest in a subject, and each student having a particular learning style in which they learn best (Horn & Staker, 2015). Online courses are an option for today's K-12 student since the online version can provide them with a differentiated and customized learning experience. This is critical as students try to learn new concepts and master standards in online courses.

Horn and Staker (2015) believe that the traditional, public education model was designed to do just the opposite of differentiation and customization. Today's classrooms were created in the "factory style" model of the Industrial Revolution. The one-room schoolhouses lost their effectiveness when town populations exploded in the early 1900s. In 1900, only 50% of 5-19 year old students were enrolled in school in the United States (Horn & Staker, 2015). Local government officials had to find a way to educate the masses through a universal system, and the factory style model was used to accommodate this growing problem across the country (Christensen et al., 2011). Standardizing the educational process helped to efficiently create an economically sound system of public education, but it has affected the ability of a teacher to customize and differentiate for individual students.

Theoretical Significance

A student's ability to collaborate with their peers and their instructor in a classroom has been shown to increase his or her understanding of new material. Vygotsky's (1978) social

learning theory, and specifically his thoughts on a student's zone of proximal development (ZPD), states that students can increase their learning by watching and working with more capable peers as they are introduced to new material. The ZPD theory conceives that a child has an actual development level that is determined by their individual problem solving. The child has the potential for a higher level of development through the guidance of an adult through working with a more capable peer (Miller, 2011). Vygotsky believed the dynamic social surroundings of a child helped to influence the whole child. He thought that every function in the cultural development of a child appears socially and then psychologically.

The ZPD theory is grounded in the processes of cooperation and collaboration. Vygotsky (1978) believed that learning leads to development. A child's participation in guided activities helps them uncover their true potential and helps to speed up their higher psychological functions (Levykh, 2008). The actual size of the ZPD is not a fixed area of number, but Levykh (2008) reports it is the ability for a child to use collaborative activities to realize their potential beyond what they can do on their own in an independent setting on task that is age-appropriate.

Vygotsky viewed interaction with a teacher and peers, along with collaborative opportunities, as critical to a child's upbringing (Miller, 2011). Vygotsky believed that a child could only do so much on his or her own with no interaction or collaboration with a peer or teacher/parent. "Vygotsky argued that only by looking at moment-moment change over time can we understand development; intelligence is not what you know but what you can learn with help" (Miller, 2011, p. 219).

Based on Vygotsky's (1978) social learning theory, a student's connectedness with his or her peers and instructor is instrumental in the learning process. Until recently, the ability to connect with peers in the online setting was limited at best. As technology advances at its rapid

pace, more quality opportunities are now available for true collaboration and connection between classmates and instructors in the virtual setting. These new online opportunities are allowing students to connect with many more peers than previously possible (Haley, 2013). These virtual opportunities are also allowing students access to their instructors at any time, not just during the traditional school day. School systems are currently using online learning opportunities as a new medium in which to learn and prepare students for the 21st century workplace (Bedard & Knox-Pipes, 2006; Haley, 2013).

The online classroom movement is creating a shift from face-to-face opportunities for students to more virtual interaction with their peers and instructor. Vygotsky's (1978) social learning theory and other similar ones stress the importance of the school experience and interaction with peers as a catalyst for basic human development (Miller, 2011). A student's ZPD could be greatly affected by this online instructional movement and its ability to connect peers from across the globe (Gredler, 2011). The ability to meaningfully connect with peers and the instructor must be addressed in the online environment if educators believe in Vygotsky's theory of ZPD and its potential impact on a student's intellectual growth.

It is imperative that educators understand the impact less face-to-face instruction may have on a student's academic success (Borup, Graham, & Davies, 2012; Luehr, 2011; Rankin, 2013). The online course model can help tailor the instructional experience for students, their opportunities for collaboration, and the ability to receive more immediate feedback from their instructor throughout the course. Vygotsky (1978) believed that learning helps jump-start internal developmental processes that only can occur when a child interacts and cooperates with others in their environment (Miller, 2011). High expectations and the teacher's ability to create collaborative opportunities for students to connect is a critical piece of Vygotsky's ZPD theory.

The ability to feel connected with an instructor and more capable peers in the online setting may help students grow their ZPD and increase their developmental potential. Thompson (2012) feels the ZPD is "a shared zone within which pupil and teacher (or more capable other) interact through symbolic or semiotic meditated activity using both psychological and physical tools" (2012, p. 91). By conducting this study the researcher hopes to understand if a student's senses of connectedness has any relationship to a student's success in the online course.

<div align="center">**Society At-Large Significance**</div>

Christensen et al. (2011) suggest that the Internet and technology are providing a disruptive innovation in educational practice. Bedard and Knox-Pipes (2006) say this is the first generation of students who will spend more time using the Internet than watching television. Haley (2013) reports that it is obvious that the Internet is the most preferred option for entertainment, information, and communication for today's student. The virtual setting has become an integral part of a student's world in the 21st century.

Technology has improved the ability for individuals to connect and collaborate with their peers from across the world. Marx (2014) reports that Gary Rowe, a member of the Futures Council 21, believes students will begin to work through the different K-12 grades at their own pace in a more mastery level approach to moving from grade level to grade level. As teachers take on the role of a facilitator, students can use technology to engage in real world, project-based learning opportunities that lead to inquiry and collaboration with peers.

This generation of students is the first in history who do not require a teacher to provide them with information (Elmore, 2010). Larry Rosen, a professor of psychology at California State University expects technology to do whatever they want it to do: "Their WWW does not stand for World Wide Web, it stands for Whatever, Whenever, and Wherever" (Marx, 2014, p. 42).

This access to information and connection with peers is unprecedented in the history of mankind and many believe it is changing the way in which students and teachers will interact in the future.

Instead of measuring students on information that may already be obsolete, Lichtman (2014) believes schools should be more focused on student-centered opportunities where collaboration and problem solving are used to assess a student's mastery of standards for a course. Competency-based assessments can be used in lieu of standardized measures to assure that each individual student, in real-world scenarios, can apply information. Information is readily available, but the ability to collaborate with peers and apply it is increasingly needed in today's work place (Horn & Staker, 2015).

Today's student has information available to him or her at the touch of a button on a cell phone, Ipad, or personal home computer. Technology tools, Internet access, and human curiosity are now allowing many students to come to school with the same and sometimes more information than the teacher has (Marx, 2014). The role of the teacher is evolving into a facilitator of that information as they help students learn to apply it in real-world scenarios. Technology is allowing teaching and learning to become a partnership where students have more time to collaborate with peers and their instructor, and less time sitting at a desk and memorizing information (Bergmann & Sams, 2012).

Data show that 50 percent of high school courses will be delivered online by 2019 (Luehr, 2011). That possible shift in educational delivery requires the need for research and studies into the online experience for students and what they need in order to be successful in these courses. As school districts look for ways to provide students with more personalized learning opportunities, they must also understand how to make these courses interactive, student-centered options that engage students in relevant learning (Lichtman, 2014).

The shift from teacher-centered, traditional classrooms to student-centered, online courses can revolutionize education in this country. A student's ability to connect with their instructor and peers from any location and at any time can provide them with opportunities never before available in the history of education (Elmore, 2010). Lichtman (2014) suggests that the "natural learning space for this and future generations is a connected knowledge space that is open and available via technology anytime and anywhere, and students are increasingly comfortable exploring and living in this space" (p. 146).

Problem Statement

Online opportunities for K-12 students are growing rapidly in school districts across the United States (Marx, 2014). As students take more online classes, educators must understand what type of online course design works best, while providing students with a quality course experience. Smith (2009) believes the student perceptions of our K-12 distance education students needs to be addressed and future research is needed. This research can help educators understand the type of course development needed to help students succeed in this course format. A student's engagement in the online course and his or her feelings of connection with peers and the instructor are areas of interest for researchers of K-12 high school online classes and programs, and should be evaluated for its impact on student success (Rankin, 2013).

As more K-12 students take online courses, the classroom instructor is becoming less involved in face-to-face interactions with students, and more as a facilitator of knowledge. Teachers can use technology to enhance the experiences of their students by creating real-world learning experiences that ask students to be active participants through guided inquiry, collaboration with peers, and the creation of projects with their various technology options. (Marx, 2014). It is imperative for school districts across the nation to understand how students

feel about their online experiences. This information can help lead to better designed courses and more student engagement in the class and with their collaboration with peers.

Purpose Statement

The purpose of this study was to evaluate the relationship between students' sense of connectedness in an online high school course and their End of Course Milestone assessment standardized scores upon completion of the course. Very little research has been done with high school students' sense of connectedness in online courses. Borup et al. (2012) believe that as online options become more available to the K-12 student, it is imperative to increase the effort by educators to improve the outcomes of students taking those courses.

The researcher hoped this study would reveal the relationship, if any, between students' sense of connection with their peers and teacher in the online course and their EOC Milestone assessment score. Understanding the relationship between a student's sense of connection in the online course and its impact on their achievement scores may help educators create better online courses for students. This study used the Online Student Connectedness Survey (adapted for high school students) and the students' EOC Milestone assessment scores to analyze the correlation between the two variables.

Scores were collected and analyzed from students taking the course in the online setting through the County Virtual Academy (CVA). The research question analyzed the data to determine if there was a significant relationship between the two sets of scores. The researcher hoped to reveal if a lack of physical contact with the instructor and more capable peers on a daily basis has an effect on a student's score on the End of Course Milestone assessment. The study results would be significant as the school district evaluates its online process and its impact on student achievement on the Georgia state standardized assessment for high school students.

Significance of the Study

Kirby, Barbour, and Sharp (2012) identify a lack of available and useful research in the online experience for K-12 students. A variety of studies exist for post-secondary students and their experiences in the online environment. There is a need for more studies to be conducted on the high school student's experiences in the online medium, with a gap in the research seen in the area of ZPD and its impact or lack of impact in a student's success in an online course. The research specifically does not address the new End of Couse Milestone assessment scores in Georgia and the difference in those scores in the traditional instructional setting versus the online setting for students.

Several research studies on post-secondary students' online experiences have been conducted (Harvey, Greer, Basham, & Hu, 2014; Rankin, 2013; Kirby et al., 2012), but the researcher found no studies completed on high school students' sense of connectedness in their online class and its relationship to their standardized test score for the course. The answer to this question may help educators understand what the sense of connection with peers and the instructor has on a students achievement scores.

It is important to identify which online course allows for more student interaction and collaboration to understand what the students' sense of connection may have on the student achievement in the course (Borup et al., 2012). This information may assist school systems in understanding what type of online techniques work best with today's student. There is very little information in the research on the sense of connectedness for online students in the K-12 environment. This area has been noted by several researchers as a focus for future studies (Haley, 2013; Luehr, 2011; Rankin, 2013).

Kim, Kim, and Karimi (2012) report that though substantial research has been conducted

in the areas of online school administration, management, and teacher development, but very little has been conducted in the student learning experience and what they think about their online interaction and collaboration opportunities. This gap in the literature reveals an area of interest as schools try to understand what students need to be successful in the virtual classroom and how best to engage them in their online experience.

Research Question

RQ1: Is there a correlation between online students' sense of connectedness in the course and their End of Course (EOC) Milestone score for students taking an EOC course through the County Virtual Academy (CVA)?

Null Hypothesis

Ho1: There is no statistically significant correlation between students' online connectedness scores, as measured by the Online Student Connectedness Survey (OSCS) and their End of Course Milestone scores for high school students taking a 16-week, online course via the Virtual Academy (VA).

Definitions

1. *Asynchronous Learning* – A learning environment in which students are able to actively participate at a time of their choosing in their own learning, giving them the opportunity to interact with their peers, provide peer feedback, and reflect on the status of their personal learning goals and outcomes (Haley, 2013).

2. *County Virtual Academy* (CVA) - The virtual academy offers high quality, online, Internet-delivered high school courses that equip students to thrive in the complex life and work environment of the 21st Century (CCSD, 2014).

3. *Competency-Based Learning* – A type of learning where students must demonstrate a

   mastery of a given subject within a flexible timeframe- including application, or creation

   of a knowledge, a skill, or a disposition- before moving on to the next one (Horn &

   Staker, 2015).

4. *Personalized Learning* – Learning is tailored to an individual student's particular needs

   and customized to help each individual succeed (Horn & Staker, 2015).

5. *Student-Centered Learning* – The combination of personalized learning and competency-

   based learning (Horn & Staker, 2015).

6. *Synchronous Learning* – When meaningful interactions in a face-to-face setting where

   lectures, discussions, and lesson presentations occur at a specific point in time with the

   expectation that all students will be available to participate (Haley, 2013).

7. *Zone of Proximal Development* – "The distance between the actual development levels as

   determined by independent problem solving and the level of potential development as

   determined through problem solving under adult guidance or in collaboration with more

   capable peers" (Vygotsky, 1978, p. 86).

Summary

Today's K-12 students have more options than ever before as they relate to the type

of instructional delivery they receive and in what manner they complete a course. The

online environment provides students with the ability to connect with their peers in their

community and across the globe. Students' engagement in these courses and their ability

to feel connected to their classmates and instructor is crucial to their success in the

course. Teachers are becoming more of a "guide on the side" for students on their

instructional journey (Haley, 2013). It is important to understand how technology can be

used to increase student achievement as students are connecting to their peers like never before in the history of education.

Chapter 2: Review of Literature

Introduction

Technology and the Internet are allowing learning to no longer be constrained to a classroom or a school building. Access to information and the ability to connect with peers across the globe is expanding exponentially each year (Elmore, 2010). Borup et al. (2012) say that historically, distance education options have only been for adult and university students, but this option is quickly expanding its reach to the K-12 educational community. Distance learning is providing students across the country the opportunity to take courses that in previous years were not available due to financial and practical issues (Smith, 2009).

The virtual, online educational option is beginning to take the place of the traditional, physical brick and mortar school setting as educators realize that learning can take place anytime and any place with all of the virtual opportunities available to today's student. These online learning opportunities and the online access students have to their classmates, teacher, and course material is changing the landscape of the traditional educational model (Haley, 2013). Advanced Placement (AP) courses, foreign language, and advanced mathematical courses that could not be provided in the past are now available to all students at the touch of a button (Smith, 2009). The online learning option is allowing students from various socio-economic backgrounds to take courses that were previously not available to them. Haley (2013) feels that online learning is equalizing educational opportunities for students across the world.

Traditional education is transforming from teacher-centered, brick and mortar buildings to student-centered, virtual learning opportunities. Horn and Staker (2015) believe that online learning options and the use of technology to enhance students' learning experiences are disrupting the world of education. This disruption allows students the ability to connect with

their peers and instructor as they move through their educational journey.

Over the last thirty years, schools have begun to use technology to enhance student-learning experiences: "In 1981, there was a computer for every 125 students in schools. In 1991 there was one for every eighteen, and by 2009, there was one for every five students" (Horn & Staker, 2015, p. 6). The abundance of computers available to students, however, did not necessarily create improved learning. The enhancement of student learning can only be accomplished through the creation and development of online learning opportunities that help customize a student's learning experience and create intrinsic motivation to gain knowledge from information.

Marx (2014) states, "like a violin in the hands of a master, various technologies can help us personalize education, deliver instruction, monitor what students have learned and where they need help, provide reinforcement, and serve as tools to conduct research" (p. 124). Technological advancements and online instructional options now provide K-12 students with learning opportunities that go beyond their traditional brick and mortar school building and the factory style model of learning. Lamport and Metz (2009) say that students are now able to connect with each other like never before in the history of education and those connections are helping to change the way we educate students.

It is imperative for educators to understand the use of online instruction and its impact on student success. The ability for K–12 online learning exploded over the past two decades, but only a small amount of research is available in the online practice (Kirby et al., 2012). It is imperative for educators to understand the significant impact technology will have on the success of students in classrooms across the United States. Rankin (2013) found topic areas for future study included "student academic performance, qualities of effective online courses and content

design, effective professional development for online teachers, and leaner characteristics and the factors that contribute to success" (p. 10).

Harvey et al. (2014) report the lack of social interaction to be an area of concern for students participating as it relates to peer to peer and student to teacher. Research of K-12 opportunities exists but Rankin (2013) reports that the literature shows a need for further research into the actual student experiences and how they impact student achievement. Harvey et al. (2014) found a positive relationship in the research with student satisfaction and success with an online course among college students, but currently there is a gap in the research as it relates to student interaction in online high school courses and the students overall success in the course.

Christensen et al. (2011) propose that online learning will transform the traditional way in which students learn. This will begin a competition between the student-centric, virtual learning experience and the traditional teacher-centric classroom instructional model. Dillon and Tucker (2011) believed that:

Instead of blackboards, schoolhouses, and a six-hour school day, interactive technology will personalize learning to meet each student's needs, ensure all students have access to quality teaching, extend learning opportunities to all hours of the day and all days of the week, and innovate and improve over time. (p. 8)

These interactive, virtual learning opportunities are changing the traditional role of the teacher and are putting more emphasis on the student as an active participant in the learning process.

Education in isolation versus online collaboration with peers may be the ultimate debate if the virtual classroom can succeed as school districts implement a quality virtual learning experience for students. Freeman (2010) believes that students need to be actively engaged in

the educational journey and that teachers are providing them with opportunities to learn practical problem solving skills. As school districts decide how to incorporate online learning options for K-12 students, budget constraints and technology improvements have helped school districts become more open to the concept of online learning for their K-12 students in recent years.

Online learning has not yet taken over the traditional instructional model in the country, but improvements in the process allow students the ability to collaborate with their peers in the online arena (Christensen et al., 2011). These collaborative opportunities are beginning to change the opinion of educators that online equals isolation. Kim et al. (2012) call for future studies to understand and the detailed conditions that lead to student success in the online setting. As each new generation of virtual learning is created, courses are becoming more and more interactive for students and teachers. As technology improves, so too does the ability for school districts to create courses where students may connect with peers from across the globe as they work toward mastering standards and concepts in a course.

Theoretical Framework

Social Learning Theory and Zone of Proximal Development

As more online learning opportunities are provided for K-12 students in public education, educators must rethink the traditional approach to teaching and learning. Schwirzke (2011) believes that schools should be providing students with 21st century skills and opportunities in the online setting to set them up for the global workforce they will enter after they complete their education. As students begin to take more online courses, their physical interaction with their peers will be limited in this new setting.

The use of technology is allowing students to become less involved with their peers as they have begun to rely on technology to learn new concepts. Harvey et al. (2014) feels that an

area of concern with online learning is the lack of a student's social interaction with his or her peers. Levykh (2008) believes that Lev Vygotsky's social development theory, and its emphasis in the area of the zone of proximal development, may have a positive influence on students when receiving computer-based instruction.

Collaboration with peers has been an instructional method since the formation of the formal educational setting. Lev Vygotsky defined his theory, the Zone of Proximal Development (ZPD) in his book "Mind in Society" (1978) as, "the distance between the actual development level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers" (Vygotsky, 1978, p. 86). Thompson (2012) describes ZPD as the psychological development of the child is acquired first through the interaction with peers and then internalized as knowledge and mastery of concepts.

Vygotsky (1978) believed that students could only acquire so much knowledge on skill on their own, but with modeling and assistance from others, they could grow their ZPD and learn to master concepts much more involved and intricate tasks. Vygotsky argued that, "the only good kind of instruction is that which marches ahead of development and leads it; it must be aimed not so much at the ripe as at the ripening functions" (Vygotsky, 1986, p. 188). Keeping a student's ZPD in mind will assist teachers as they create opportunities for increased cognitive development. The online environment opens up connection opportunities that will assist teachers in the creation of differentiated experiences to increase a student's ZPD.

The use of technology allows students to become physically less involved with their peers in a physical setting but more connected with them in the online setting. Technology allows students to collaborate with assistance from technology as they access a vast amount of

information (Freeman, 2010). Technology provides students a way to learn that may not involve physically interacting with their more capable peers. This new type of connection is opening up new opportunities where students can participate in the virtual world with peers from across the state, country, and globe (Elmore, 2010).

Technology and the online learning environment may provide opportunities for students to collaborate with peers from anywhere in the world as they learn new concepts while increasing their ZPD. These opportunities are creating a world where students can connect with their peers on a level never before available (Horn & Staker, 2015). Online learning allows a student to take risks and learn by trial and error. Students are not all working on the same thing at the same time. They can progress through the online material at their own pace while asking questions at any time, with no risk of ridicule or embarrassment (Haley, 2013).

School districts are beginning to rely on more online and computer-based instructional methods to educate their students versus traditional course offerings, and technology is changing the way we educate our students (Cobb County School District [CCSD], 2014). School districts must understand the appropriate use of technology and the academic benefits of its use as they create student-learning opportunities. Vrasidas, Zembylas, and Chamberlain (2003) believe that more research needs to assess and evaluate the online learning experience for to improve course offerings, pedagogical practices, and student assessment. Technology can provide differentiated and student-centered activities that can engage students and provide them with meaningful learning experiences (Christensen et al., 2011).

Kurvitis and Kurvitis (2013) feel the student-centered instructional model helps engage students more than a teacher-centered model of instructional delivery. They believe a teacher-centered delivery of instruction leads to passive students who are not engaged in the learning

process. Virtual courses and online instructional opportunities provide student-centered learning opportunities where students can be active participants in their learning experiences while moving through the course on their own (Christensen et al., 2011). Online instructors become more coach than teacher. In the online classroom setting, peers may be students from the local community or from across the entire state or country. The teacher's role in a student-centered classroom is to create the course framework and then provide support as students become more personally active in the acquisition of mastering concepts and standards (Stix & Hrbek, 2006). A student-centered course provides students with the support they need to learn on their own as they collaborate with their peers through the process.

As online learning opportunities for students increase, the role of the instructor will begin to evolve. Stix and Hrbek (2006) believe that teachers can assist more students when they function as more of a coach. They should move away from the role of supplying direct instruction and to a position of facilitator. This can create opportunities for real-world projects, discussions, or debates that are more student-centric in nature (Stix & Hrbek, 2006). Providing students with opportunities to work through problems on their own is crucial in today's workplace (Elmore 2010). Learning from their failures helps them master new concepts that they can use in real-life situations. Students must learn to creatively react to real-life problems as they mature and grow as learners.

Lev Vygotsky (1998) chose "non-independent problem solving as the method of identifying maturing higher cognitive functions that establish a student's zone of proximal development (ZPD) at a particular time" (1998, p. 204). The four ways a teacher can examine these emerging functions are: To assess if a child can imitate the steps after seeing a demonstration, start the problem and observe the child to see if they can complete it; have the

child cooperate with a more capable peer; or explain the principles of solving the problem, ask the child guiding questions, and then break down the task with the child to check for their understanding of the task (Vygotsky, 1998).

The ZPD theory has given rise to some key concepts for student success in today's classroom environment. Gredler (2011) believes that Vygotsky's theory of ZPD and a child's cognitive development has repercussions on current educational practice on at least three different areas. These areas include rethinking current instructional and pedagogical practices, expressing concern about the curriculum currently in place in today's traditional school setting, and the implication of the revision and creation of new curriculum (Gredler, 2011). Assessments focused on the ZPD of a student would challenge students to master concepts as they grow their cognitive awareness level and grow their vertical relationships among concepts (Gredler, 2011).

The use of scaffolding, dynamic assessment, and collaborative learning are all crucial elements to the ZPD theory (Shabani, Khatib, & Ebadi, 2010). Those concepts involve the student, classroom peers, and the teacher in the enrichment of the learning environment. Students who take online courses with no direct physical interaction with their more capable peers or a teacher limit their opportunities for traditional social interaction. In the context of learning, Vygotsky believed that a child's development within a their ZPD revolved around the three key areas of interaction with peers, dialogue with adults and peers, and facilitated interaction between the child and their instructor (Wertsch, 2007).

The ZPD is future-oriented and is always interested in what the child can do after he or she has had help understanding a concept or activity. Levykh (2008) believes an educator can observe a child solving a problem and see the future mental development and capacity they have

for the development of more mature psychological functioning. Development occurs only when children confront a difficult activity, and they cannot manage it on their own (Zaretskii, 2009).

The Social Learning Theory and the concept of ZPD is based on the belief that individuals learn from watching or working with someone else, mastering the concept individually, and finally moving on to a more difficult task. Vygotsky's (1986) socio-cultural theory of child development believes the interaction between the parent, teacher, or peer with an individual student is crucial to the creation and development of that student's cognitive skills. The significant piece to the socio-cultural theory is the ZPD theory. Vygotsky believed the ZPD was a moving target that could be increased through collaboration with more capable peers (Birjandi and Sarem, 2012). More capable peers or adults have the ability to assist students as they grow their ZPD and begin to master concepts on their own without the aid of others.

An online learning experience can be very different from a traditional classroom experience for as student. Technology provides opportunities not available in the traditional setting while allowing the instructor to be more of a guide for students as they make their way through a course (Christensen et al., 2011). The online setting will look much like a constructivist classroom as the teacher takes a less direct role in the delivery of instruction and the learning is more student centered (Haley, 2013).

Greene and Ackerman (1995) say that for many educators, a constructivist classroom setting can be unique. A constructivist classroom setting allows the student to be at the center of the learning as the instructor participates as a facilitator of the knowledge, and acts as more of a guide for the student (Greene & Ackerman, 1995). The online learning experience offers today's students the ability to take an active role in their own learning (Haley, 2013). They attempt to

understand concepts and master course standards while still being supported by the instructor and their peers in the virtual classroom.

Review of the Literature

Emergence and Growth of Online Learning

The ability to work at a student's own pace and the extra help that can be available in the online setting are two factors that are leading to an increase in the online enrollment across the country (Bedard & Knox-Pipes, 2006; Cavanaugh, 2006; Kim et al., 2012). Watson, Gemin, Ryan, and Wicks (2009) believe that today's student is choosing online courses for the options, choices, convenience, and flexibility that it provides them compared to the traditional classroom. Federal and State governments are looking to find unique ways in which to serve a variety of student needs in today's educational world.

The Internet opened the door for online opportunities for students that have not been available in the past (Daniels, 2008). The introduction of online learning has broken down traditional instructional offerings and instructional boundaries, while at the same time, creating its own unique cultural phenomenon for the current generation of students (Liang, Thanq, and Chen, 2012). The Internet has opened up the world to today's student and is providing students with the ability to connect with each other across the globe (Chandler, Tolbert, & Amber, 2012).

The beginning of online learning started out with a small number of participants, but over the last two decades, participation in online courses has grown exponentially all over the world. The first virtual schools serving the K-12 population got their start during the exponential increase in Internet access across the United States in the late 1990's (Rankin, 2013). Students are now able to create, interact, and collaborate with their peers through the online platform.

Historically, students had only been able to work through a traditional course in a synchronous manner, with all students learning the material at the same time, in a lecture style method with little interaction between teacher and student (Scarborough & Ravaglia, 2014). The online technology options have opened the door for a more asynchronous method of learning. Scarborough and Ravaglia (2014) believe that live, interactive experiences for students in the online setting works best for students taking courses with classmates from across the globe. These opportunities to interact in real time enhance the course and help build connections between students and their peers.

Picciano, Seamon, Shea, and Swan (2012) feel that the world is just seeing the beginning of online learning in K-12 education, and that the future growth of the process will be significant in the education of students. The most important piece of the online learning model is the student having access to the technology needed to work in the online environment. Liang et al. (2012) believe that the access to technology is a key factor in the implementation of online opportunities for students. The accessibility to the technology and online environment is key to its growth in the educational world.

During the 2007-2008 school year, online enrollment in one or more courses exceeded one million students in the United States with around 70% of those students taking courses at the high school level (Picciano et al., 2012). Luehr (2011) says the data suggests that 50 percent of high school courses will be delivered online by 2019. With the demand for online opportunities for students, it is imperative for K-12 educational institutions to understand the impact online learning is having across not only the United States, but also the entire world. Friedman and Friedman (2011) believe offering online courses to students is a cost-effective way for schools ranging from kindergarten through graduate school to offer more courses and opportunities for students.

Generation iY

Elmore (2010) has coined the term Generation iY for students in today's educational world. This generation of students thinks, feels, and learns differently than past generations (Hawkins, Graham, Sudweeks, Barbour, 2013). Students have more access to information than any other generation before them, and the ability to connect to each other like never before. The belief is that this generation of students is constantly connected and that technology is not seen as an innovation, but a requirement for them to feel something is important. A disconnect between how schools delivers instruction and how students want to receive the instruction has widened, and students are not happy with what they are receiving (Elmore, 2010). Generation iY students are bored with the traditional classroom setting where the teacher acts as the sage on a stage and all students are required to move at the same pace (Elmore, 2010).

The traditional instructional model in education is all about teaching memorization and fact recall. Research on the iY Generation has discovered these students desire a healthy, trusting relationship with their teacher, an interactive learning community, and a creative innovative approach that stimulates the right brain (Elmore, 2010). Standardized testing and school accountability has made the way in which we teach students a mechanized approach that is easy to evaluate and collect data for school report cards. Elmore (2010) believes students in Generation iY are right brain thinkers who are being taught in left-brain schools. The left side of one's brain is about knowledge while the right side is about creativity. The left side of one's brain is definitive and the right side is innovative.

Elmore (2010) also believes that students in Generation iY learn through "uploading" rather than "downloading". Downloading is explained as a teacher lecture or dissemination of material and information at a rapid pace where the student is given everything by the teacher and

told to memorize the information for a test, and then it is forgotten. Elmore (2010) explains uploading is a student-centered activity where they can express themselves and move through an activity at their own pace. Uploading allows students to be creative and show their understanding of the material in the way in which they best learn. Elmore (2010) suggests that the uploading experience allows students to grow through the participation with others and their interaction with their peers through multiple platforms.

Benefits of the Online Experience

Kim et al. (2012) believe that students choose the online setting for many different reasons that include, but are not limited to, course acceleration, freedom of choice, pace of the course, and their difficulty with the traditional school setting. The traditional instructional setting is very different than the virtual online experience. In the virtual setting students have access to online lectures and discussions and can review these multiple times, providing them with an advantage over a student in a traditional classroom who only can get the lecture one way and at only one time (Bedard & Knox-Pipes, 2006).

In the traditional setting, the students have the ability to physically connect with their peers and teacher on a daily basis. A traditional school is thought of as a building of mortar and bricks, with bells announcing the class changes throughout the day. Mahrenholz (2010) believes the online experience is more about clicks, than about bricks.

In a study conducted by Cavanagh (2006), students reported a preference to online learning to traditional classes because of its flexibility and that it allowed them to work on their schoolwork at any time during the day. Lim, Kim, Chen, and Ryder (2008) also conducted a study and found similar results to Cavanaugh's (2006) findings. Students reported that flexibility

and convenience were major factors in their satisfaction with the online experience. Based on those experiences, they would recommend taking an online course to a peer.

Virtual course options are changing the delivery model in public education and making educators reevaluate the traditional teaching and learning practices (Watson et al., 2009). The use of technology has allowed students to become less involved with their peers as they have begun to rely on technology to learn new concepts. Zunker (2008) believes that Lev Vygotsky's Social Development Theory and its emphasis in the area of the ZPD has a direct influence on students when receiving computer-based instruction. Harvey et al. (2014) suggests that an area of concern with online learning is the lack of a student's social interaction with their peers.

Zunker (2008) believes the computer can act as the "more knowledgeable peer" in the ZPD dynamic. The computer-based instruction can provide the needed support to a student who may not be getting enough support in the traditional setting. The role of the teacher or facilitator in guiding the online student through the process is found to be critical by Ng and Nicholas (2010). They think the role of the teacher in the online experience is to provide a presence, maintain continuity and guidance, be a motivator, and mentor students as they learn how to understand and apply the information in the course (Ng & Nicholas, 2010).

Teachers in today's classrooms facilitate student learning as they assist them in navigating through the unlimited amount of information available to them. Technology is providing students a way to learn that does not involve physically working with their more capable peers. It does, however, provide them a way to connect with an unlimited number of peers from across the globe in the virtual setting. These opportunities have never been available to students in the past and are allowing students in today's classrooms to make connections never before possible in the history of education (Scarborough & Ravaglia, 2014).

In the past, direct instruction has been the norm for most typical classroom settings. The teacher in front of the room, and the students seated in rows, listening and taking notes in with little or no interaction with peers. Liang et al. (2012) believe the internet is allowing students to have an online presence that could be more communicative and engaging than the actual physical setting students are used to. In the past, collaboration was just seen as another instructional strategy, and today it is viewed as an integral part of the development of a student (Liang et al., 2012).

Students who take online courses with no direct physical interaction with their more capable peers or a teacher have limited opportunities for traditional social interaction. The online setting does, however, create a flexible, innovative way for students to interact without a time constraint (Liang et al., 2012). The creation of online coursework that provides opportunities for student interaction with their peers throughout the course is an integral part of a successful online program (Lee & Figueroa, 2012). Langenhorst (2011) suggests that texting options, online chat rooms, audio and video conferencing, and virtual classrooms have helped to make the online environment more like the traditional face-to-face instructional model and have helped to provide a sense of community for students who take online courses.

Success Factors in the Online Process

A student's sense of community has been shown as a major factor in the success a student has in an online course (Hawkins et al., 2013). Teacher support and interaction with peers are both areas the researchers pointed out as being consistently visible in successful online students. Particular learning style profiles have also been shown as a precursor for success in the virtual world for a student (Rankin, 2013). Tomlinson and Imbeau (2010) say four distinct areas shape a student's learning profile. The four areas are: Learning style, intelligence reference, gender,

and culture. These four areas all help shape the students' learning and approach to different tasks. The online environment allows students with various learning styles to work through the information at their own pace and in their personal way of understanding the material (Malcom, 2009). The traditional classroom setting does not allow this and all students move at the pace the teacher sets for the class despite their various learning differences.

Roblyer and Marshall (2003) note that the online success of students occurs when the constant ability to connect with others and their coursework eliminates the geographical boundaries in place in the traditional setting. To be successful in the online learning environment, students must be self-motivated and self-directed (Daniels, 2008). Research collected in a study by Barbour, Siko, Sumara, and Simuel-Everage (2012) found the virtual school environment provided students with the flexibility to work at his or her own pace, moving ahead of everyone else if that was their desire. Daniels (2008) believes that the virtual classroom provides students with the ability to receive individualized instruction while focusing on content mastery as compared to the industrial style model of the traditional classroom.

Harvey et al. (2014) report that students who participated in an online course said they most enjoyed the flexibility of the online experience and the ability to do their work from home. To be successful in the online experience, students must maintain a good work ethic and keep in contact with their peers and instructor. These two areas are critical to the success of students in the online environment. Kerr (2011) believes a successful online course is a direct result of teachers and students maximizing the tools afforded to them throughout the duration of the course. Students must take an active role in their education in the online setting and use their instructor as a mentor and their classmates as collaborative peers.

Research has established that online teachers assume several different roles. They may act as a coach, facilitator of the content, a collaborative partner, and the organizer designer of the material (Mahrenholz, 2010; Malcom, 2009; Picciano et al., 2012). In the online setting, students must assume the responsibility for their own learning if they are to be successful in an online course. Chandler et al. (2012) believe that as more and more traditional K-12 educators begin to design and use online curriculum, it is important that they understand what has worked in the past. Instructional techniques in the traditional, face-to-face instructional model do not always work in the online setting. Haley (2013) believes some advanced students who are bored in the traditional setting may be more successful in the online setting. They can progress through the course at their own pace. They can take advantage of the ability to take courses for college credit along with other courses they may not have had time to take in the traditional setting.

Advantages and Disadvantages of Online Learning

Based on the research, online learning has several possible advantages and disadvantages for students who take online courses. Grubb (2011) says that the online learning experience's largest advantage is its flexibility of both location and time. Students have the ability to work on their courses whenever they want to and from wherever they are. They are neither constrained to a brick and mortar building, nor limited by their peers in the classroom and the teacher's instructional pace.

To be successful in online courses, students have to be highly motivated and work well independently (Lowes, 2005). The instructional design of the content must include student-to-student collaborative opportunities that allow students to reflect and respond to each other throughout the course (Zucker, 2005). Lowes (2005) identified several indicators of success in the online setting. Those included: Much closer supervision by teachers, constraints of

traditional education eliminated thus allowing more innovative instructional practices, and the availability to offer many more options and courses for students. The online course setting can provide these and many more much-needed pedagogical options for students and teachers that may collaborate in a more effective and efficient manner.

The online experience can allow students to take courses that they may not have been able to take due to several factors. The school may not have a certified teacher for a particular course or the student may have a class load during the day that prohibits him or her from taking a certain traditional course (Grubb, 2011). Also, due to greater school accountability across the nation, schools have been forced to find ways to improve their graduation rates and overall student performance. Picciano et al. (2012) explains the relatively new phenomenon of online credit recovery courses and their impact in the online world of education. These offerings were practically non-existent until recently but are now offered at almost all high schools across the country. These courses allow students to re-take courses in the online setting. These online credit-recovery courses help students get back on track for graduation after previously failing a course.

The opportunity for students to be presented with differentiated activities during their online experience is also an advantage of the process. Grubb (2011) believes online learning offers opportunities for students to show their mastery of standards through a differentiated process that allows them to use their preferred learning styles throughout a course. Not all students learn in the same way or at the same pace, so the inclusion of several different instructional mediums at the pace of the student may help them to better understand the material for the course (Horn & Straker, 2015).

The theory of social development, as it relates to Lev Vygotsky's ZPD (Miller, 2011), is an important part of the online discussion and may be seen as a disadvantage to the online experience. Individuals believe there are disadvantages to the online experience (Grubb, 2011), but the ZPD theory has given rise to some key concepts for student success in today's classroom environment. The use of scaffolding, dynamic assessment, and collaborative learning are all crucial elements of the ZPD theory (Shabani et al., 2010). The online experience takes students out of the traditional setting and physically away from their peers and the course instructor, thus limiting their physical collaboration with others. Miller (2011) says that Vygotsky believed what students "can do with the assistance of others (zone of proximal development) is a better reflection of their intellectual ability than what they can do alone" (p. 183).

Another disadvantage for the online experience is the perception of a lack of academic integrity and the possibility for students to cheat their way through a course (Grubb, 2011). Opportunities to cheat in the online setting are very real and must be monitored throughout the course. Kerr (2011) explains a best practice in an online course is the creation of authentic learning experiences for students. These assignments can help limit the ability to cheat on an assignment due to their unique creation and possible grading.

Kim et al. (2012) believe that technology is blurring the line between brick and mortar schools and the online classroom setting. Online options are helping to enhance instructional pedagogy and helps students learn anytime, anyplace, and at any pace. Many educational researchers believe education as we know it in the United State is changing at a rapid pace, and the available online options are growing daily (Horn & Staker, 2015; Lichtman, 2014; Haley, 2013; & Scarborough & Ravaglia, 2014). Glader (2009) states, "Approximately 100,000 of the 12 million high-school-age students in the United States attend 438 online schools on a full-time

basis. This is an increase of 30,000 from 5 years ago" (para. 6). Some students are not even taking one traditional high school course on campus. With several types of online learning opportunities, there is tremendous potential for the growth and expansion of online opportunities for all K-12 students in the United States as more students are provided the opportunity to participate in online course offerings.

Types of Online Learning

There has been rapid growth in online programs across the country in recent years (Schwirzke, 2011). The Department of Education estimates the number of online schools and enrollment in online schools each year (Watson, Gemin, Ryan & Wicks, 2009). As of 2009, 45 states, including Florida, California, and Texas, had some form of statewide online initiative or school for secondary students in their state (Watson et al., 2009). Online education opportunities are rapidly growing in this country as various educational entities create new and differentiated ways for K-12 students to complete their coursework (Dillon & Tucker, 2011).

There are several types of online learning opportunities for secondary students in the United States. Dillon and Tucker (2011) report:

> The types of online schools and programs range from state-run programs like Florida Virtual School, where each year 100,000 students take one or two courses online as a supplement to traditional schools, to "blended" models, which allow schools to combine online and classroom-based instruction. (p. 1)

Overall, research on K-12 virtual education is limited at this time. Virtual opportunities at the post-secondary level are much more prevalent. The limited amount of research-based knowledge on high school students and their success with online learning is crucial to the development and improvement of the process. Educators, parents, and students must understand

the different online learning options available and the strengths and weaknesses of each program as they relate to the students' successful learning opportunities.

Dillon & Tucker (2011) say the most controversial virtual schools are cyber charter schools where students attend on a full-time basis, but the schools function independently from local school districts by companies with no federal regulations. These programs are increasingly hard to track and to evaluate based on their charter school status. These virtual schools are also causing states to struggle on how funding should be handled for the programs. With little to no physical expenses incurred for brick and mortar buildings, the virtual student seems to require less funding than the traditional student. State decisions on funding can dramatically affect the impact and availability of the virtual opportunities for their students in a particular region or state.

County Virtual Academy

The County Virtual Academy (CVA) is a particular online learning option for secondary students. The CVA "offers high quality, Internet-delivered high school courses that equip CVA students to thrive in the complex life and work environment of the 21st Century" (CCSD, 2014, p. 1). The CVA opened in 2001 and has served over 13,000 students since its inception. During the 2013-2014 school year, the CVA served 3,000 students from the school district. Students have the opportunity to take CVA courses during the year on a tuition basis for after school options as well as for free if taken as part of their school day schedule.

State certified district faculty members teach all online CVA courses. Each CVA course meets national, state, and school district curriculum standards. The school district (2014) believes "the County Virtual Academy effective online educational programs – quality teachers, quality curriculum, and constant teacher-student collaboration. The CVA suggests that students

are exposed to rigorous courses through the online, which allow students to be creative while using higher order thinking skills, collaborate with their peers as they work in the digital age of the 21st century (CCSD, 2014).

The Role of the Online Instructor

Technology allows the 21st century teacher the ability to instruct and assess students in ways never before possible (Marx, 2014). The use of technology and its ability to allow immediate feedback and constant contact between the teacher and student is helping to change the traditional educational experience (Harvey et al., 2014). Interactions between peers and the instructor help to foster student achievement in traditional and online classrooms (Dixson, 2010). It also develops a more personalized learning opportunity for students. Mahrenholz (2010) says that is a necessity for online instructors to understand their students' needs and their particular learning profile. This will assist them in providing the appropriate instructional material as they deliver the lesson via the online setting.

Technology allows teachers to create student-centric instruction that allows teachers to maximize class time and provide personalized learning opportunities. Christensen et al. (2011) believe the goal of every educator should be to ensure that all students have the skills and capabilities to break away from their current situation and help realize their dreams through a student-centric learning model. Teachers can begin to use assessment for learning, not of learning (Fullen, Hill, & Crevola, 2006).

Assessment of student success and its impact on perceived learning gains has changed over recent history. Spaulding, Garcia, and Braun (2010) feel the role of the teacher is to help all students achieve high-quality learning outcomes. Teachers in today's classrooms are asked to assess student progress at a much more frequent rate than in the past. Current research has begun

to study education in a more scientific manner and identify effective assessment strategies that can improve student performance (Dixson, 2010). These strategies have been identified by researchers as ones already used by effective instructors teaching meaningful, engaging lessons in their classrooms.

Marzano, Pickering, and Pollack (2001) helped to define successful classroom instructional practices for the nation and the effect they have on student achievement. These best practices show the impact a teacher has on student achievement and the necessity of research-based instructional practices for increasing student achievement. Reflecting on teaching practices is necessary for teacher growth and student success. Research has shown the use of reflective practices in the student-centric classroom model has a positive impact on student achievement (Spaulding et al., 2010).

Reflective practice on common formative and summative assessments allows teachers to create personalized learning opportunities and more meaningful lessons that are driven by the data analysis of the assessments. Spaulding et al. (2010) believe that reflective practice is necessary for teachers as it helps them constantly looking at ways to improve their craft and the way they interact and instruct students. This reflective practice should include the analysis of data to increase student-learning outcomes, as well as improve lesson development and teaching delivery.

Teachers have traditionally been understood to be the expert in the course they teach. Their instructional delivery has always been viewed as crucial to the development of their student's educational growth. The ability to work with their students, understand how they learn, and get to know them on a personal level, has been shown as an important factor in raising student achievement. New approaches to educational practices are helping teachers maximize

their students' learning experiences while allowing them to engage their students with more meaningful, relevant lessons and activities geared toward their learning style and preference. These new approaches are not changing the role of the teacher, instead they are enhancing that role. They are helping to improve instructional practices, and in turn, improving student achievement.

New technological advances allow the classroom teachers to change the way in which they foster creativity and concept acquisition among students. Technology cannot replace the wisdom of a teacher and his or her personal experiences that are used to help students understand concepts and their application in real-world situations. The use of blogs, email, video conferencing, and other technological tools allows students to connect with their instructor and peers at any point in the day, not just during the traditional school day. Students still require an instructor to guide them through the vast amount of available information and to disseminate what is important and what can be learned at a later date. Students need a teacher to develop meaningful, engaging lessons for them as they grow as learners, and technology can be used to enhance that practice.

Information is available to students today at the touch of a keystroke. Teachers need to understand this as they help facilitate student learning and help guide students through the educational process. They should assist students as they learn to take information and apply it in real world situations through student-centric activities and lessons. Koenig (2010) says that true learning comes from actual experiences learned from the interaction between student and teacher as opposed to rote memorization of material for dissemination at a later date. Moving from rote memorization to application is a huge step in a student's ability to use higher order thinking skills in real-life situations.

Technology can help teachers maximize their time with students. In the past, teacher-student interaction could only occur in the classroom and was very limited. With modern technology, teachers and students can be in constant contact, and lessons can be taught in virtual settings as well as face-to-face. Zhao (2009) says research shows that there is no significant difference between online and the traditional face-to-face instruction. In the online setting, interaction and collaboration among students and the instructor can occur through texts, discussion boards, email, and other online settings that can help build a sense of connectedness for a student in any course.

The key to student success is the ability to provide immediate feedback and daily formative assessments that can track a student's progress (Miller, 2015). These areas are crucial to the role of today's teacher as an educational guide and facilitator of knowledge. Students' academic success hinges on their ability to understand where they are making mistakes in the application of knowledge and how to improve upon those mistakes.

Elmore (2010) believes today's student is wired differently than prior generations of students. Students do not need the teacher to stand in front of the room and lecture to them in a direct instructional setting. That information is available to them at the touch of a keyboard. This new generation of student requires a teacher who understands individual learning styles and can provide learning opportunities for students by taking advantage of their particular style of learning (Tomlinson & Imbeau, 2010). Teachers should incorporate technology into their lessons to enhance student learning and to maximize their time with the students, while providing immediate feedback and collaboration among peers (Malcom, 2009).

The "flipped" classroom concept is a concept that has become popular with incorporating technology and communication with assessment and data analysis (Bergman & Sams, 2012).

Today's teacher can use video lessons, online activities, and other digital opportunities to deliver information to their students outside of the classroom setting and as they assess student progress in the course. This allows teachers to maximize their instructional time at school with their students. The "flipped" classroom model allows time for re-teaching and remediation for those who need it as well as acceleration for those who are ready to move on with student-centric learning opportunities (Bergman & Sams, 2012; Horn & Staker, 2015).

The teachers in the 21st century classroom must understand the unique differences each student brings to their class. Students learn in different ways and at different times. The constant assessment of student progress immediate feedback is crucial to the overall success for all students (Malcom, 2009). Today's classroom teacher must facilitate student-learning opportunities and then provide them with support as they learn new information. They then must help them learn how to apply it in a situation while providing constant, constructive feedback on their progress in the course.

The role of today's teachers is more of a partnership with their students in a collaborative instructional model (Stix & Hrbek, 2006). In a student-centric classroom, teachers must be active participants with their students, and act as a guide who gets to know their students on a personal level, while assisting them on their educational journey. The teachers should use the technology available to them to provide their students with immediate feedback when possible while providing opportunities for students to connect with their peers in applying information through performance-based tasks (Langenhorst, 2011). Teachers should facilitate their students' understanding of new concepts and how to apply them in real life situations. In a study conducted by Langenhorst (2011), the rapport between built between the instructor and the student, along with constant monitoring of student progress, allowed the teacher to provide

proper feedback to students who needed it. The positive relationships and support efforts allowed the instructors to create learning environment that was student-centered.

Like a sport's coach, today's teacher must motivate by teaching, guiding, and learning to listen for what students need. When they struggle and lose motivation, teachers should provide the student with necessary support to re-engage and continue on with the task at hand (Stix & Hrbek, 2006). Teachers can no longer be the sage on a stage, delivering facts and figures while students memorize the information for a test. They must be a data collector, data analyzer, and data-driven user of information that assists them in creating student-centric learning opportunities for their students while helping to guide their students through the process as they grow as a learner.

Online Learning & Vygotsky

Zunker (2008) believes that Vygotsky's social development theory, and its emphasis in the area of the zone of proximal development (ZPD), has a direct impact on students receiving online, computer-based instruction. Zunker's (2008) study evaluated elementary age students with disabilities and the impact computer-based learning had on their academic achievement in mathematics. The study used a control group of students who received instruction in a traditional setting and a study group that received computer-based instruction. The researcher hoped to see if there was any added achievement or motivation when comparing the two types of mathematical instruction for elementary age students with disabilities.

The study conducted by Zunker (2008) revealed a difference in student achievement and motivation when using computer-based instruction for students who need help in mathematics. The study's review of literature also shows a strong bond between using computer-based interventions and the social development theories of Jean Piaget and Lev Vygotsky. The data

and research indicate that students like the positive, immediate feedback that computer-based programs can give them when learning new concepts. Zunker (2008) believes the computer can act as the more knowledgeable peer in the ZPD dynamic and that computer-based instruction gives the support to students that they may not be getting in the traditional setting.

Kaio (2011) conducted a research study to investigate the academic achievement rates of students with disabilities in the traditional instructional setting versus the online instructional setting as measured by the Texas Assessment of Knowledge and Skills (TAKS). The study observed the variables of age, race and gender as they relate to student achievement outcomes. The researcher evaluated if students with disabilities are making the same progress on their TAKS when using computer-based, online learning when compared to their peers who received their instruction in the traditional setting. The researcher's review of literature found there is no significant difference in the performance of students attending virtual schools and those attending traditional schools. The research study hypotheses were found to be statistically significant in at least one area each, but none of them in all areas. Kaio (2011) found there is very little research to confirm or deny the success rates of students with disabilities and their success rate in education. When comparing traditional versus online education, Kaio (2011) believes more studies should be conducted to see if there is a correlation between the use of online courses and higher student achievement.

Linkenhoker (2009) conducted a causal-comparative quantitative study to investigate the effect online learning had on Advanced Placement Calculus AB course final grades for high school students. The study used archived student achievement scores in an Advanced Placement Calculus AB Course. Student scores were compared between students who received traditional instruction in five different high schools in Massachusetts, and students who received their

instruction in the online setting, the Virtual High School (VHS). The data from the Linkenhoker (2009) study revealed no significant difference for those individuals who received their instruction in the traditional manner versus those who took the course online. Three different research questions were posed for the study, but due to the limited availability of data, only one of the research questions could be addressed. The researcher acknowledged the need for more data to conduct a more thorough study

A mixed-methods study by Lewis, Whiteside, and Dikkers (2014) evaluated the benefits and challenges of online learning for at-risk high school students in North Carolina. Students from the North Carolina Virtual Public School (NCVPS) and the North Carolina Performance Learning Center (NCPLC) were selected for the study. The mode of instruction for NCVPS students is through the Moodle and Blackboard online learning management systems. Students interacted with their peers and instructor exclusively in the online setting.

The NCPLC serves students who have not been successful in the traditional classroom setting. There are five Performance Learning Centers (PLCs) in North Carolina and in 2012-2013; the NCPLC model served 700 high school students. The NCPLC students complete their coursework through a self-paced, online curriculum with both face-to-face instruction and an online environment.

Lewis et al. (2014) found that the NCVPS students benefited from the access to their courses twenty-four hours a day, seven days a week. This flexibility allowed students to work at their own pace and whenever they wanted to work on their course. The NCVPS online experience also allowed for mastery learning opportunities for its students. Students could show mastery of a unit in a pre-test and then could skip that module and move to the next unit. This

individualization of instruction helps to differentiate learning opportunities for students as they have various levels of background knowledge in all of the courses in which they participate.

Students from both the NCVPS and NCPLC reported self-motivation as a key factor in their successful completion of their coursework. The study found that though students enjoyed the totally online experience, they felt the need for support as they began the process. They found there is a learning curve to the online instructional environment for both time management and the learning management system and how it works.

Lewis et al. (2014) believe that trouble shooting technical problems and persevering through online issues is critical with today's virtual courses, but learning course content should be the most important factor in the online experience. The study conducted by Lewis et al. (2014) revealed that when the proper support is in place, the online learning experience can benefit at-risk students who may thrive in an environment outside of the traditional classroom instructional setting.

Summary

Online learning has been identified as a key factor in the future of education (Christensen, Horn, Johnson, 2011; CCSD, 2014; Jacobs, 2010). Schwirzke, (2011) believes its ability to help relieve overcrowded classrooms, outdated school schedules, a lack of quality teachers and course offerings in rural and poor areas of the country, while providing a way to differentiate instruction for students regardless of location or time constraints are just some of the ways in which online learning can revolutionize education.

Online learning assists students to learn intrinsic motivational skills that will be essential for them to have as they move into the 21st century workplace (Sheninger, 2014). Providing students with the ability to connect with their peers in the online setting may help change the

way in which students are educated in this country. The implications from higher education research suggest that basic constructivist principles can be used in virtual classroom design to obtain an overall positive result (Townsend, 2009).

Kirby et al. (2012) identify a lack of available and useful research in the online experience for K-12 students. A variety of studies exist for post-secondary students and their experiences in the online environment. Smith (2009) says that there is a definite need for research into K-12 distance learning and the impact interaction and collaboration has on student success. Research shows a need for more studies to be conducted on the high school students' experiences in the online medium, with a gap in the research seen specifically in the area of student interaction along with a sense of community with their peers and instructor in the online setting (Daniels, 2008; Hawkins et al., 2012; Malcom, 2009).

The intent of this study was to evaluate the correlation between online students' EOC Milestone assessment scores and the students' online connectedness survey scores. Scores were collected and analyzed from students taking the course in the online setting through the CVA. The researcher determined if there is a statistically significant correlation between both sets of scores. The researcher hoped to reveal if students' sense of connectedness with their peers and instructor in the online setting have any effect on their score on the EOC Milestone assessment.

Chapter 3: Methods

The purpose of this study was to understand the relationship between high school students' sense of connectedness in their online course as it relates to their End of Course Milestone assessment score. This chapter describes the research design, participants, setting, instrumentation, procedures, and data analysis.

Design

This research study was conducted using an observational correlational research design to evaluate the first research question. The bivariate correlational research design was appropriate for this study due to its ability to determine the strength of relationship between two variables (Gall, Gall, & Borg, 2007). The research study's goal was to determine the relationship between students' sense of connectedness in an online course and the students' EOC Milestone assessment scores. The independent variable for the study was the students' survey scores from the Online Student Connectedness Survey. The dependent variable for this research study was the students' EOC Milestone assessment scores.

Gall et al. (2007) say that the use of bivariate correlational statistics for the research question is appropriate "because each coefficient expresses the magnitude of a relationship between two variables" (p. 345). The null hypothesis for this research study was that there is no statistically significant correlation between students' online connectedness and EOC Milestone scores. The researcher tested the correlation through the use of the product-moment correlation coefficient (r), better known as Pearson's r. Gall et al. (2007) believe Pearson's r should be "computed when both variables that we wish to correlate are expressed as continuous scores" (p. 347).

When conducting a quantitative correlational study, "the product-moment correlation is the most widely used bivariate correlational technique because most educational measures yield continuous scores and because *r* has a small standard error" (Gall et al., 2007, p. 347). Howell (2011) states that the correlation coefficient can be affected by three characteristics of the sample that include: Restrictions of the range or variance, nonlinearity of the relationship, and the use of heterogeneous subsamples (p. 203). No range restrictions for this study were used for the independent or dependent variables. Howell (2011) believes the more usual effect of restricting the ranges of the two variables leads to a reduced chance of correlation. The lack of a range restriction helped the study eliminate a bias in the non-linearity of the relationship between the independent and dependent variable in the study. The study did include a heterogeneous subsample that includes 35.9% male and 64.1% female participants.

Research Question

RQ1: Is there a correlation between online students' sense of connectedness in the course and their End of Course (EOC) Milestone scores for students taking an EOC course through the County Virtual Academy (CVA)?

Null Hypothesis

Ho1: There is no statistically significant correlation between students' online connectedness scores, as measured by the Online Student Connectedness Survey (OSCS) and their End of Course Milestone scores for high school students taking a 16-week, online course via the Virtual Academy (VA).

Participants and Setting

The participants for this research study were all students enrolled in the County Virtual Academy (CVA) during the fall semester of 2015. All of these students were enrolled in a

course that includes an End of Courses (EOC) Milestone assessment upon completion of the course. The state of Georgia assesses students with an EOC Milestone assessment in the following courses: 9th grade Literature, 11th grade Literature, Algebra I, Geometry, United States History, Economics, Physical Science and Biology. Approximately 207 students made up the sample population, with their median age being 16.7 years of age. Participants for this quantitative research study were chosen through the use of convenience sampling. Gall et al. (2007) state that in a correlational study, a minimum of at least 30 participants are required when conducting a quantitative study. The researcher believed that the return rate on the 207 student surveys would be enough data for the study's results to be generalized.

A total of 35.9% of the population was male and 64.1% female. The participants' ethnic background was 43.6% Caucasian, 51.3% African-American and 5.1% Multi-cultural. Gall et al. (2007) believe it is best to plan this in the design stage so sample sizes can be evaluated and found to have statistical power. The researcher found that with a total population of 207 students eligible to participate in the survey, at least 36 total students would have to participate in order to get a 15% margin of error with a 95% confidence level (Raosoft.com, 2016). All students who were enrolled in an online CVA EOC Milestone course were asked to take a survey for the study. The correlation between the two variables was evaluated for all online EOC classes: 9th grade Literature, 11th grade Literature, Biology, Physical Science, Algebra I, Geometry, Economics, and United States History.

The study took place in a school district located northwest of Atlanta, Georgia. The school district is one of the largest school districts in the country and served over 111,000 students during the 2014-2015 school year. Participants for this study included all students enrolled in an online county virtual academy course that is associated with an EOC Milestone

Assessment. The study took place during the fall semester of 2015. EOC Milestone assessment score data and student connectedness scores using the OSCS survey were used for the study. The population of the study included all CVA students who were enrolled in an online EOC Milestone Course during the fall of 2015.

The school district (2014) reported that the CVA offers a web based high school course delivery for students that will assist them in the internet based daily life and work environment in which they live. The CVA opened in 2001 and has served over 13,000 students since its inception. During the 2013-2014 school year, the CVA served 3,000 students from the school district. Students had the opportunity to take CVA courses during the year on a tuition basis for after-school options as well as for free if taken as part of their school day schedule (CCSD, 2014).

State certified school district teachers teach each CVA course through an online platform. The teachers did not have any kind of physical interaction with the students, and all communication is done virtually or by phone. Each CVA course met national, state, and county curriculum standards. The school district believes "the Virtual Academy offers the hallmarks of truly effective traditional education programs – quality teachers, quality curriculum, and frequent student-teacher interaction" (CCSD, 2014).

Instrumentation

The purpose of the study was to determine if there is a statistically significant relationship between a CVA students' online sense of connectedness in their online course, as seen through their connectedness score using the OSCS, and their EOC Milestone assessment score. The ability to understand student perceptions of the online experience can lead to the creation and implementation of more student friendly virtual courses for students. During this research study,

students were asked to take the OSCS to assess their perception of connection and community with their peers and instructor in their online course. Bolliger and Inan (2012) created the OSCS due to increased online course growth and the emerging concerns of student feelings of isolation and disconnectedness with their peers and instructor.

The EOC Milestone assessment is a state mandated, standardized, criterion-referenced assessment that is given to high school students in the state of Georgia at the completion of eight different high school courses (Georgia Department of Education [GADOE], 2016). Students receive a scaled score upon completion of the test. The EOC Milestone assessment's first year of implementation in Georgia was during the 2014-2015 school year. The EOC Milestone assessments are taking the place of a similar test, referred to in the past as the End of Course Test (EOCT; Georgia Department of Education [GADOE], 2014). The EOCT was a deemed a valid tool as measured by its publisher and developer and was used to determine the academic achievement level of students enrolled in an EOCT course (GADOE, 2014).

The EOC Milestone assessment tests were normed by the state of Georgia after the 2014-2015 implementation and have been shown to be a valid and reliable test of course knowledge (GADOE, 2016). There are several phases the state of Georgia goes through in the development of validity on their standardized assessments. "By attending carefully to each phase of the test development process, the GADOE can ensure that the Georgia Milestones Assessment System consists of valid instruments" (GADOE, 2016, p.3), with the understanding that the validation of a test is an ongoing process.

The EOC Milestone assessments were also reported to reliable by the Georgia State Department of Education (GADOE, 2016). The GADOE (2016) reported that the reliability of a test is the degree to which test scores are stable and consistent for a particular group over a

period of time. The reliability indices provided by the GADOE (2016) indicate the following

reliability numbers from the Spring 2015 administration of each EOC Milestones assessment

test; 9th grade Literature (.90), 11th grade Literature (.88), Algebra I (.90), Geometry (.90),

Biology (.91), Physical Science (.88), United States History (.90), and Economics (.89). "These

reliability indices indicate that the tests provide consistent results and that the various

generalizations of test results are justified" (GADOE, 2016, p. 12). The GADOE (2016) believes

that the reliability data also supports their claim of validity of the EOC Milestone assessments.

Bollinger and Inan (2012) created the OSCS to understand a student's perception of

connectedness with their peers and instructor in the online classroom. Bollinger and Inan (2012)

established the validity of the OSCS by having it reviewed by a group of distance learning and

instructional technology experts at three different universities in the United States. The

researchers calculated the internal reliability coefficient for the instrument and its subscales after

several groups of online university students were administered the questionnaire. Bollinger and

Inan (2012) created four sub categories within their survey they believed were the four main

areas of interest for their research.

The OSCS survey was created to assess the overall connectedness felt by students in the

online setting and consists of four subcategories: comfort, community, facilitation, and

interaction and collaboration (Bolliger & Inan, 2012). The researchers conducted a factor

analysis that confirmed the OSCS's four subscales of comfort, community, facilitation,

interaction and collaboration. These four areas were identified as critical to the online learning

student. Bolliger and Inan (2012) reported the reliability coefficients for the OSCS survey and

its subcategories were high and revealed a high internal consistency for the overall survey

instrument. This analysis provided information needed for the researchers to declare the OSCS

to be a valid and reliable measure of students' perceived connectedness in the online environment.

The OSCS consisted of a 25-question survey that uses a Likert-scale ranging from 1, strongly disagree, to 5, strongly agree, to assess student perceptions of their online experience (Bolliger & Inan, 2012). Gall et al. (2007) believe a survey should include at least 10 items to obtain a reliable understanding of the participant's attitude of the research topic. Personal attitudes consist of three components: (1) affective, which relates to the individual's feelings; (2) cognitive, which includes the person's beliefs or understanding of the subject; and (3) behavioral, which is the way in which the person would act toward that action presented to them (Gall et al., 2007). Bollinger and Inan (2012) report the 25-item OSCS "instrument's reliability to be very high (.97)" (p. 49). Gall et al. (2007) say that a test that yields a reliability of .80 or higher is acceptable for use in most research studies.

The participants were initially asked to take the OSCS through the online survey portal of Survey Monkey (basic version). The use of the online survey can reduce the possibility of missing data within questions, and there will be less chance of data entry error on the part of the researcher when collecting and analyzing the results (Gall et al., 2007). Since the participants are taking an online course and are being asked to assess their perception of the connectedness they feel in the course, the researcher feels it is only appropriate to use an online survey option with a 5-point Likert-scale to collect the perception data.

The other instrument used in this quantitative multivariate correlational study was the End of Course (EOC) Milestone assessment given to each student in an EOC course. In educational settings, students are traditionally tested with standardized assessments, which are categorized as either norm-referenced or criterion-referenced. In a norm-referenced assessment,

individuals acquire a score based on a comparison of their score with all other individual

participants (Gall et al., 2007). A small number of people will receive the highest scores or

lowest scores with the majority of individuals receiving scores in the middle. Gall et al. (2007)

reports that a criterion-referenced measurement's major purpose is to get a precise estimation of

the student's performance level and domain areas in which they struggle. EOC Milestone

assessments were developed for students in Georgia as criterion-referenced assessments to

measure student mastery of standards for selected 9-12th grade courses and to show domain

areas of strengths and weaknesses for individual students.

Federal regulations have required that states become much more accountable as it relates

to their educational progress across the country. Over the past two decades, a large number of

states have created end of course tests (EOCTs) as part of their formal assessment of students'

for graduation purposes (Domeleski, 2011). In 2002, only two states reported using EOCT

scores as an assessment of student achievement in their state. By 2011, that number had

increased to nineteen states considered in full implementation and another nine states developing

EOCT tests for their high school students (Domeleski, 2011). Some states use the EOCT scores

as a criterion for graduation eligibility, while others use it along with a student's final grade in

the class to promote students and award course credit. Currently, thirteen states use these EOCT

scores to ensure that a high school diploma is a meaningful indicator of requisite student

achievement (Domeleski, 2011).

Gall et al. (2007) say the "reliability of a test refers to the degree to which measurement

error is absent from the scores yielded by the test" (p. 200). They go on to define validity as "the

degree to which evidence and theory support the interpretation of test scores entailed by

proposed use of tests" (Gall et al., 2007, p. 195). The GADOE has addressed validity in their

test creation, item development, and the development of their EOC administration procedures. The GADOE (2016) provided adequate statistical data to establish the EOC Milestone's reliability and validity.

Procedures

The researcher secured IRB permission from Liberty University as well as permission to conduct the study by the County School District (CSD). The researcher developed a permission form and letter explaining the study for parents and students to review, and accept or decline their participation in the study. The letter and consent forms were sent electronically to the parents of 207 students who took an online, EOC CVA course during the fall semester of 2015. The consent forms were delivered electronically through email correspondence with the students and the CVA. Online instructors were not be a part of the process, as the researcher does not want students to feel as if their answers would in any way influence their teacher's perception of them.

Completion of the consent forms and survey for students was optional. It was highly recommended that they take it, but only with parental permission. Students who returned a parental consent form were to be sent the OSCS via an email during the 14th week of their 16-week course. The researcher created a copy of the OSCS in the online platform of Survey Monkey. Students were to be given login information and an explanation of survey expectations prior to completing the survey.

The researcher worked with the CSD Virtual Academy principal to acquire students' EOC test data for all students who participate in the study upon completion of the course. EOC scores were reported to the GADOE in January of 2016. Data from both the OSCS and EOC Milestone assessments were used to conduct the correlational research study.

The researcher asked the EOC district coordinator to extract those EOC scores for any students who took an EOC course through the CVA in the fall of 2015. The researcher used all student OSCS scores along with their EOC scores to compute the product-moment correlational coefficient (*r*) on the data to understand the relationship between the two variables included in the research question for this study.

Data Analysis

The research question for this study is: is there a statistically significant correlation between online students' sense of connectedness in the course and their End of Course (EOC) Milestone scores for students taking an EOC course through the County Virtual Academy (CVA)? The researcher collected the data from OSCS scores from the fall of 2015 and using SPSS 23.0 software, conducted a bivariate correlational study on the relationship among students' connectedness and their EOC Milestone assessment scores. Gall et al. (2007) say an advantage of a correlational design is that it allows the researcher to show to what degree a relationship exists or does not exist between more than two variables when several variables exist among a large number of participants.

The researcher collected OSCS data after students complete the survey. Responses were reported by course and then by individual student, based on the Likert-scale ranging from 1 (*strongly disagree)*, to 5 (*strongly agree*). These scores show the students' level of perceived connectedness with their peers and instructor in their online course. EOC Milestone assessment scores were collected and used as data in the bivariate correlational study.

After collecting the numerical data, the researcher computed Pearson's *r* with SPSS 23.0 software using the data collected from the study. Gall et al. (2007) report that the "correlational research designs are used for two major purposes: (1) to explore causal relationships between

variables and (2) to predict scores on one variable from research participants' scores on other variables" (p. 337). The researcher conducted a Bivariate, Zero Order Correlation and computed Pearson's *r* with SPSS to generate scatter grams to understand the linearity of the collected data and the correlation between both sets of scores.

When $r = 0$, no relationship exists (Gall et al., 2007). Gall et al. (2007) reports that $r = .1$ to .29 as a small relationship, .30 to .49 as a medium relationship, and .50 to 1.0 as a large relationship. Gall et al. (2007) state "if the scatter grams for research data indicate that the relationship between two variables is markedly nonlinear, the research should compute the correlation ratio (*eta*)" (p. 349). This computation can provide a more accurate index of the two variables' relationship as the researcher determines the extent of correlation between the two variables. The researcher used both a Pearson's *r* analysis and a bivariate scatterplot analysis to understand the level of relationship the students' OSCS score had with their EOC score. The *p* value for statistical significance for the Pearson's *r* analysis for research question one was set at $p \leq .05$.

Chapter Four: Findings

Research Question(s)

RQ1: Is there a correlation between online students' sense of connectedness in the course and their End of Course (EOC) Milestone score for students taking an EOC course through the County Virtual Academy (CVA)?

Hypotheses

Ho1: There is a statistically significant correlation between students' online connectedness scores, as measured by the Online Student Connectedness Survey (OSCS) and their End of Course (EOC) Milestone scores for high school students taking a 16-week, online course via the County Virtual Academy (CVA).

Descriptive Statistics

The participants for this research study included students enrolled in the CVA during the fall semester of 2015. The study took place in a school district located northwest of Atlanta, Georgia. The school district is one of the largest school districts in the country and served over 111,000 students during the 2014-2015 school year. Participants for this study included 207 students who were enrolled in and completed an online virtual academy course that is associated with an EOC Milestone Assessment. The state of Georgia assesses students with an EOC Milestone assessment in the following courses: 9th grade Literature, 11th grade Literature, Coordinate Algebra, Analytic Geometry, United States History, Economics, and Biology.

The study analyzed EOC Milestone data and student connectedness scores acquired through the student's participation in the OSCS survey. The sample population of the study included all CVA students who were enrolled in an online course that required an EOC Milestone assessment during the 2015 fall semester. Upon completion of the semester, per the

CVA counseling department, only 207 students actually completed the course with continuous enrollment throughout the fall semester to earn a reported grade in the course.

The 207 students who made up the sample population for this quantitative research study were chosen through the use of convenience sampling. Gall et al. (2007) state that in a correlational study, a minimum of at least 30 participants are required when conducting a quantitative study. The researcher determined that with a total population of 207 students eligible to participate in the survey, at least 36 total students would have to participate in order to get a 15% margin of error with a 95% confidence level (Raosoft.com, 2016).

A total of 39 parental consent forms and completed surveys were gathered during the data collection. The researcher acknowledges that the margin of error calculation is higher than the desired amount. The total number of returned and completed surveys for the study was low and forced the researcher to use a high margin of error percentage to keep the confidence level at 95%. Based on the power analysis, the research data gathered and analyzed for this study is just large enough to help generalize this study for future use. The correlation between the OSCS score variable and the EOC Milestone assessment score variable was evaluated for all online classes to determine if there was a statistically significant correlation between the two scores.

Prior to beginning this study, the CVA emailed a letter explaining the study and the parent consent forms to the parents of enrolled CVA students in mid-November. This email was sent to the parents' personal email address they provided to the school district. The email, as seen in Appendix D, gave explicit instructions on the purpose of the survey and how to reply to the researcher. Parents were to read the letter and the consent form. If they agreed to have their student participate in the study they were to print the consent form, sign it, and either send it back to the researcher via email, or take a picture of it and text it back to the researcher. This

plan was not successful and the researcher only received feedback from two parents of the 207 students who received an email.

Next, the researcher sent paper copies of parental consent forms to each school. School administrators were asked to hand deliver the consent forms to the students who were enrolled in a CVA EOC course during the fall of 2015. Eligible students were asked to take home the consent form, have their parent complete it, and then return it to the school. Paper copies of the parental consent forms were sent home in December, at the end of the 2015 fall semester.

The paper copy of the letter explaining the research study and the parental consent forms were exactly what was emailed to parents through the CVA in November 2015. Students were asked to take the consent form home to their parents. Parents had the choice to allow their student to participate in the study. If they chose to participate they were asked to return the signed parental consent to the local school administrator. Upon return of the parental consent form, each student was provided with an OSCS to complete and return.

Prior to beginning the study, the initial IRB research plan explained that students in the research study would answer the OSCS through the online survey platform of Survey Monkey. Due to a lack of participation by parents and the return rate on the parental consent forms through the online consent form process, the researcher felt that the data collection process had to be simplified. The researcher elected to have the OSCS paperwork hand delivered to students and have them fill out the survey instead of trying to communicate with them via email.

Consent forms were sent to the local school and were given to eligible participants in the study. The students were asked to take the consent form home, have it signed, and then return it to their local school administrator. Once that form was returned, the students with permission, were given the OSCS to complete and return. Students completed the OSCS and returned it to

their local school administrator. Students returned the OSCS to their local school administrator.

The surveys were collected by the researcher. A total of 39 parental consent forms and student

surveys were completed and returned.

The OSCS paperwork was collected throughout the month of January 2016. SPSS 23.0

was used to evaluate the OSCS data. The mean age of the 39 participants who returned both the

parent consent form and OSCS was 16.7 years old, as shown in Table 1. Students ages 16-18

comprised the majority of the study participants. The study includes four 15-year-old students,

thirteen 16-year-old students, fourteen17-year-old students, 6 18-year-old-students, one 19-year-

old student, and one 20-year-old student.

Table 1

Observed Student Age Mean

Age	Frequency	Percent
15 yrs.	4	10.3
16 yrs.	13	33.3
17 yrs.	14	35.9
18 yrs.	6	15.4
19 yrs.	1	2.6
20 yrs.	1	2.6
Total	39	100.0

The gender of the students as shown in Table 2 displays that 25 (64.1%) of the 39

participants were female and 14 (35.9%) of the 39 participants were male. As shown in Table 3,

17 students' (43.6%) identified their race as White, 20 (51.3%) African American/Black, and 2

(5.1%) identified their race as Multiracial.

Table 2

Observed Student Gender Frequency

Gender	Frequency	Percent
Male	14	35.9
Female	25	64.1
Total	39	100.0

Table 3

Student Ethnicity

Race	Frequency	Percent
Black	20	51.3
White	17	43.6
Multiracial	2	5.1
Total	39	100

Of the 39 participants, 8 (20.5%) were in 9th grade, 11 (28.3%) were in 10th grade, 10 (25.6%) were in 11th grade, and 10 (25.6%) were in 12th grade as shown in Table 4. The researcher believes the reported grade levels could be misleading. The school district assigns students to specific grade levels based on their completion of certain courses, not years of attendance at the school. A fourth year student could still actually be classified as a 9th grader based on their completion of certain courses based on the district's academic progress policy.

Table 4

Observed Student Grade Level

Grade	Students	Percent
9th	8	20.5
10th	11	28.2
11th	10	25.6
12th	10	25.6
Total	39	100.0

The research participants were chosen from CVA students taking online courses with a required EOC Milestone Assessment at the completion of the course. The EOC Milestone assessment is a mandated, Standardized Georgia state assessment test that all students in the state of Georgia must take upon completion of several different high school courses (GADOE, 2016). These courses included; 9th grade Literature, 11th grade Literature, Biology, Physical Science, Algebra I, Geometry, United States History and Economics.

Of the 39 participants, eight (20.5%) were enrolled in 9th grade Literature, eight (20.5%) were enrolled in 11th grade Literature, seven (17.9%) were enrolled in Biology, two (5.1%) were enrolled in Physical Science, zero (0%) were enrolled in Algebra I, 4 (10.3%) were enrolled in Geometry, 6 (15.4) were enrolled in United States History, 4 (10.3%), and 4 (10.3%) were enrolled in Economics as shown in Table 5. All EOC courses are represented in this study except for Algebra 1. There were no students enrolled in an Algebra 1 course during the 2015 fall semester with the CVA.

Table 5

Percentage of Students Enrolled in each EOC Course

Course	Frequency	Percent
9th Lit	8	20.5
11th Lit	8	20.5
Biology	7	17.9
Economics	4	10.3
Geometry	4	10.3
Physical Science	2	5.1
US History	6	15.4
Total	39	100.0

There was no opportunity to survey any students in the Algebra I course for this study. No students were enrolled in the Algebra I course during the fall 2015 semester with the CVA. The Algebra 1 course is a requirement for graduation in the state of Georgia. The researcher cannot explain why no students took an online Algebra 1 course during the fall semester of 2015 and acknowledges that the absence of data for this course could limit the findings for the study. The other EOC Milestone assessment courses all had student participation among the CVA students and there is no explanation as to why no student took the course in the online setting during the fall of 2015.

The various EOC Milestone assessment courses were all represented among the 39 participants in the study with the exception of the Algebra 1 course. The Algebra I class had zero students enrolled in a CVA course during the fall semester of the 2015 school year. The

CVA had only two students take the Physical Science course in the online setting during the fall of 2015. The researcher believes that the number of students participating in the CVA Physical Science course may be low due to the fact that most high schools do not teach the subject because the district allows students to take the course in 8th grade during middle school.

The research study had the potential for 207 participants in the sample population in nine different courses. The researcher believes the data collected represents a very small sample of the eligible population for this study. There is, however, a somewhat equal distribution of scores represented for the study from each EOC Milestone Assessment course, except for the Algebra I course, which is not represented at all in this study. The researcher does believe that the small amount of participants in each subcategory limits the study and its ability to be generalized for future research. The student participation frequency for each course can be seen in Figure 1.

Figure 1

Number of Participants in Each Course
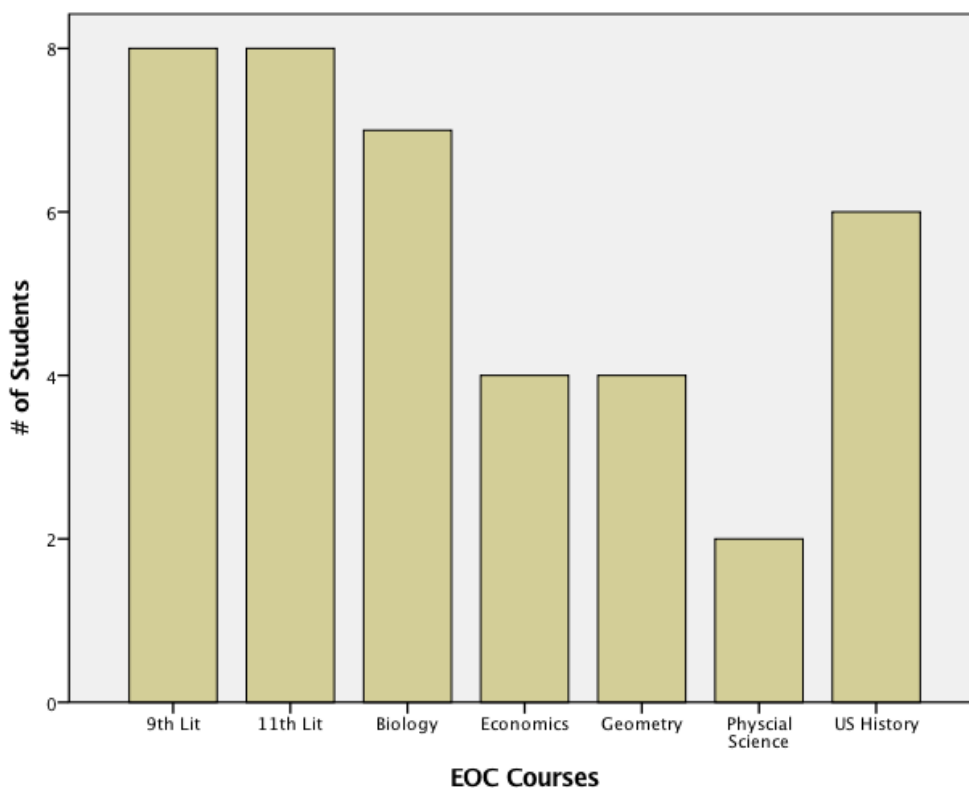
The EOC Milestones assessment scores were analyzed to determine the overall mean and distribution of scores as they related to the study. As shown in Table 6, the overall mean for all EOC courses was M=69.36 with SD=10.895 and a score range from 46-92.

Table 6

Descriptive Statistics of the EOC Assessment Scores

N	Students	39
	Missing	0
Mean Score		69.36
Std. Deviation		10.895
Range of Scores		46

The academic grading scale for the CVA school district is; A=90-100, B=80-89, C=73-79, D=70-72, and F=69 and below. The frequency of each student's EOC Score and the associated grade for the particular score can be seen in Table 7. The associated grade for the EOC score is also listed in Table 8 to show the frequency in which that grade and score occurred for the participants.

Table 7

Frequency Distribution of EOC Assessment Scores

Letter Grade	Numerical	Number of Students	Percent
F	46	1	2.6
F	50	1	2.6
F	52	1	2.6
F	57	1	2.6
F	58	1	2.6
F	59	2	5.1
F	60	3	7.7
F	62	1	2.6
F	63	1	2.6
F	64	1	2.6
F	65	2	5.1
F	66	2	5.1
F	67	1	2.6
F	69	3	7.7
F	70	1	2.6
D	71	1	2.6
D	72	3	7.7
C	76	2	5.1
C	77	2	5.1
C	79	2	5.1
B	81	1	2.6
B	82	2	5.1
B	83	1	2.6
B	89	2	5.1
A	92	1	2.6
		Total 39	100.0

The EOC assessment pass/fail distribution seen in Figure 2 reveals that 54.1% (Green) of students failed their EOC assessment and 45.9% (Blue) passed the EOC assessment with a passing grade of 70 or better.
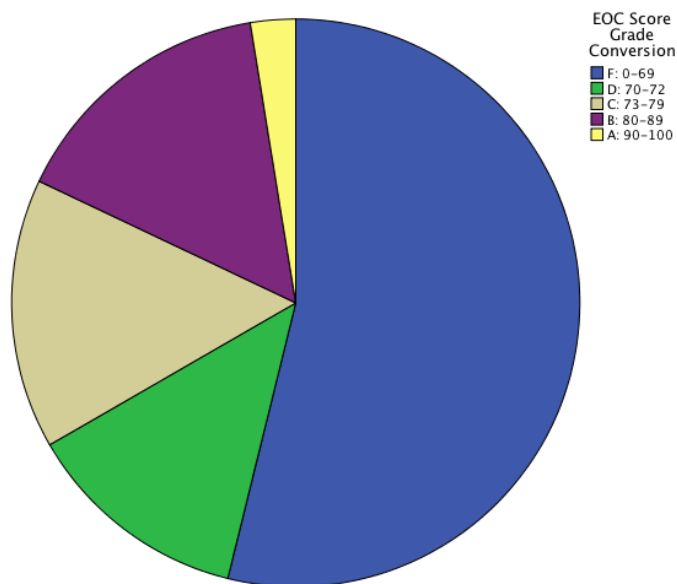
Figure 2

EOC Milestone Assessment Score Pass/Fail Rate
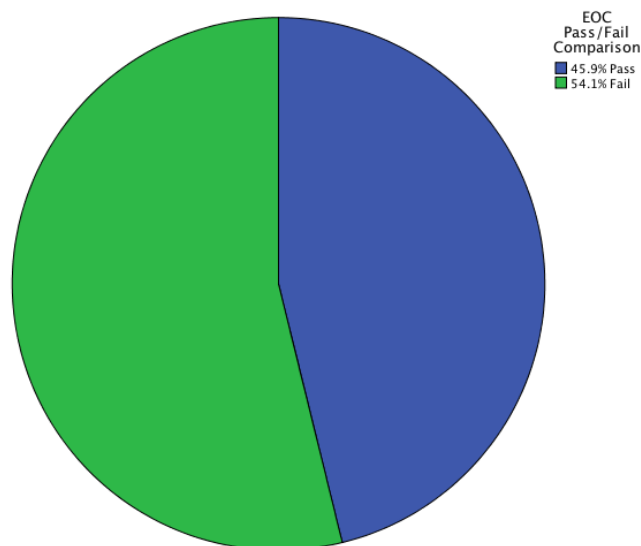
As seen in Figure 3, data analysis shows that of the 45.9 % of students who passed their EOC Milestone Assessment; 5 students (12.9%) fell in the range of D, 6 students (15.3%) earned a C, 6 students (15.4%) earned a B, and 1 student (2.6%) earned an A on their EOC Milestone assessment. The scores were all assigned a letter grade based on the school district grading scale to show the range of grades each score represents. The graph reveals the scores were evenly distributed among the letter grades of B, C, and D, with a majority of students failing (69 or below) their particular EOC Milestone assessment and only one receiving an A (90 or above).

Figure 3

Distribution of EOC Score Letter Grade Assignment

As seen in Figure 4, the analysis of scores revealed an equal distribution of scores across the various EOC Milestone assessment courses. The range of scores was 46, with a low score of 46 and high score of 92, with an overall mean of $M = 69.36$. The various EOC Milestone assessment courses were equally represented among the 39 participants in the study with the exception of the Algebra 1 course.

The Algebra I class had zero students enrolled in a CVA course during the fall semester of the 2015 school year. The 39 students who returned parental consent forms and completed surveys all participated in the various EOC Milestone Assessment courses. The researcher had no control over which students from each course completed a survey with parental consent. With 207 total potential participants in the sample population in nine different courses, the researcher believes there is an equal distribution of scores represented for the study.

Figure 4

Distribution of EOC Milestone Scores
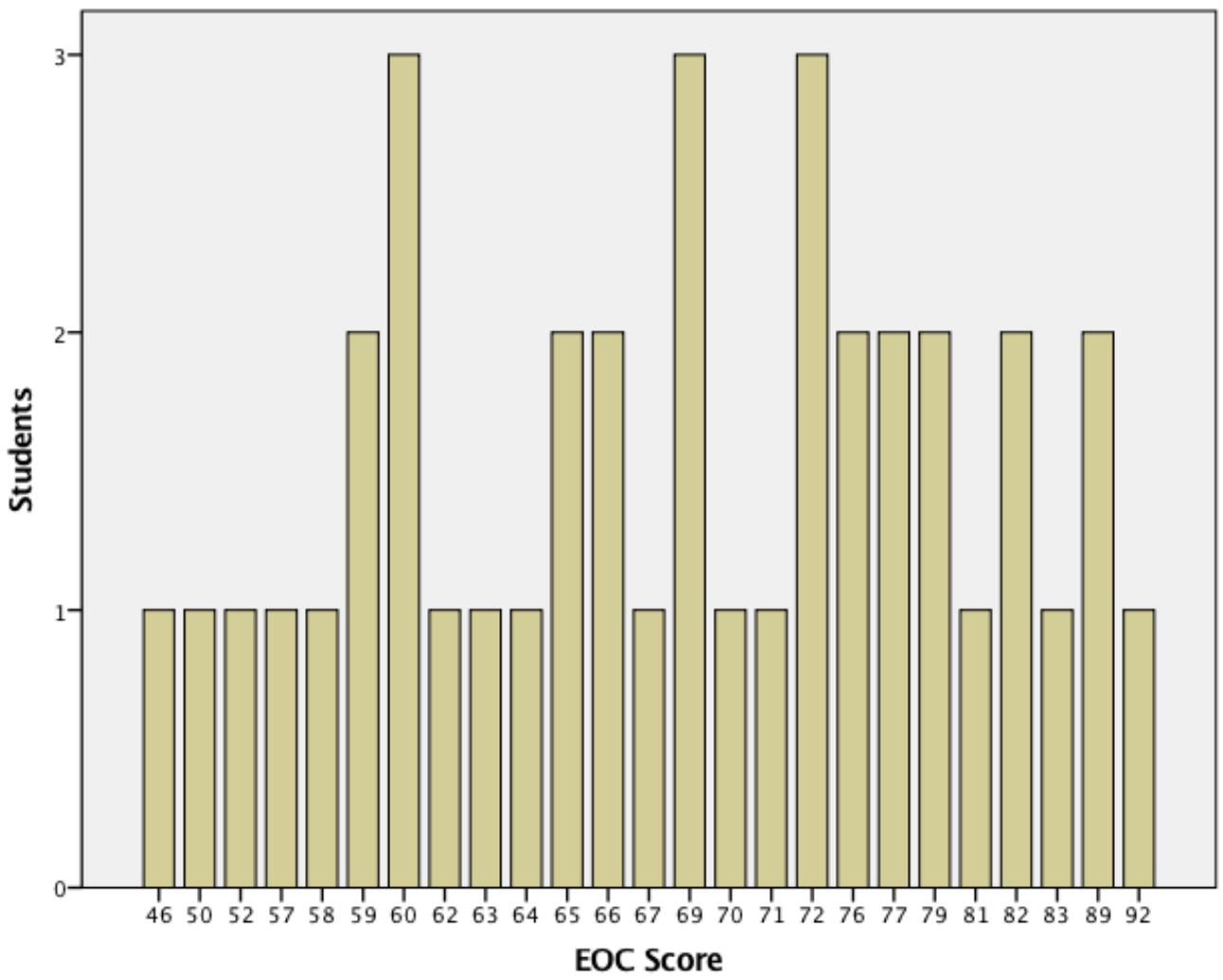
The Online Student Connectedness Survey (OSCS) scores were analyzed to determine the overall mean and distribution of scores as they related to the study. As shown in Table 8, the overall mean for all OSCS was $M=3.19$ with $SD=.6122$ and a score range 2.52, with a low score of 1.88 and a high score of 4.40. Table 13 shows the list of all OSCS scores and the participant frequency of each score found in the study.

Table 8

Descriptive Statistics of the OSCS Scores

N	Students	39
	Missing	0
Mean Score		3.19
Std. Deviation		.6122
Range of Scores		2.52

Table 9

Frequency Distribution of OSCS Scores

OSCS Score	Frequency	Percent
1.88	1	2.6
2.24	2	5.1
2.36	1	2.6
2.48	1	2.6
2.56	1	2.6
2.64	2	5.1
2.68	1	2.6
2.72	1	2.6
2.76	2	5.1
2.80	1	2.6
2.88	1	2.6
3.04	1	2.6
3.08	1	2.6
3.12	2	5.1
3.16	2	5.1
3.20	1	2.6
3.24	2	5.1
3.32	1	2.6
3.36	1	2.6
3.48	1	2.6
3.52	3	7.7
3.56	1	2.6
3.72	1	2.6
3.80	1	2.6
3.96	3	7.7
4.00	1	2.6
4.12	1	2.6
4.36	1	2.6
4.40	1	2.6
Total	39	100.0

The data from Table 9 was analyzed along with the data from Table 7 using a bivariate correlational analysis. Pearson's *r* was calculated to evaluate the null hypothesis for this research study: There is no statistically significant correlation between students' online connectedness scores, as measured by the Online Student Connectedness Survey (OSCS) and

their End of Course Milestone scores for high school students taking a 16-week, online course via the Virtual Academy (CVA).

Results

Null Hypothesis

The null hypothesis in this research study was: There is no statistically significant correlation between students' online connectedness scores, as measured by the Online Student Connectedness Survey (OSCS) and their End of Course Milestone scores for high school students taking a 16-week, online course via the County Virtual Academy. The null hypothesis was tested using a bivariate correlational analysis of Pearson's product-moment correlation to determine the correlation between the students' EOC score and their OSCS overall score. Green and Salkind (2011) state "the Pearson product-moment correlation (r) assess the degree that quantitative variables are linearly related in a sample" (p. 257).

There are two assumptions the researcher makes in testing for a significant relationship using the Pearson product-moment correlation, Pearson's r. These assumptions include: "the variables are bivariately normally distributed and the cases represent a random sample from the population and the scores on variables for one case are independent of scores on these variables for other cases" (Green & Saklind, 2011, p. 258). In SPSS software, the Pearson's r is calculated as an effect size. The range is from -1 to +1. The closer the calculation is to +1 or -1, the more positively or negatively statistically significant the correlation is between the variables.

The researcher used SPSS 23.0 to compute Pearson's r for the study. The significance level for the test was set at a = .05. Green & Saklind (2011) report that for behavioral science research, "correlation coefficients of .10, .30, and .50, irrespective of sign, are, by convention, interpreted as small, medium, and large coefficients, respectively" (p. 259). If $p \leq .05$, the

correlation between the students' EOC scores and their OSCS overall score would be determined as a statistically significant relationship between the two variable. If $p \geq .05$, the correlation between the two variables would be found to not be statistically significant.

Research Question

RQ: Is there a correlation between online students' sense of connectedness in the course and their End of Course (EOC) Milestone score for students taking an EOC course through the County Virtual Academy (CVA)? The researcher conducted a bivariate correlational analysis to determine if there was a statistically significant correlation between students' EOC score and the Online Student Connectedness Survey (OSCS) overall score. Pearson's *r* was calculated and the p value was set at $p \leq .05$ to check for a statistical significant relationship between the two variables.

The OSCS score is reported as an overall score and then broken down to the four different categories found within the survey: Comfort, Community, Facilitation, and Interaction and Collaboration. Each area is significant as the researcher understands the sense of connection students have in their online course and then how that sense of connection relates to their End of Course (EOC) score. The areas of comfort, sense of community, adequate facilitation, and interaction with collaborative opportunities with peers were designated as subcategories within the OSCS. Bollinger and Inan (2012) believed these four areas were the most important when analyzing a student's sense of connectedness in an online course. These areas are important to consider as students become more connected in the online classroom setting. Bollinger and Inan (2012) believe the Internet and online courses can be a medium to assist students with feelings of social isolation and assist them in interacting on a more regular basis with their peers.

The results of the correlational analysis, as seen in Table 10, revealed the correlation was found to be not statistically significant. The Pearson's product-moment correlation revealed that there was no statistical significance found in the correlated values of EOC score and OSCS overall score. The significance level for the correlation between EOC score and OSCS overall survey results was found at .06. The p value was set at $p \leq .05$ for this research study.

Table 10

EOC & OSCS Correlation Results

		EOC Score	OSCS Score
EOC Score	Pearson Correlation	1	.30
	Sig. (2-tailed)		.06
	N	39	39
OSCS Overall Score	Pearson Correlation	.30	1
	Sig. (2-tailed)	.06	
	N	39	39

*$p \leq .05$

With a p value of .06, there was not enough evidence to establish a statistically significant correlation between the student's EOC score and their OSCS Overall survey score based on the Pearson's product-moment correlation calculation and analysis of data.

The researcher conducted a one-sample *t*-test on the Online Student Connectedness Survey results as shown in Table 11 to evaluate whether the mean score was significantly different from 3. The number 3 was chosen because a value less than 3 on this particular survey

instrument implies a negative response to the survey questions in each category on the OSCS

Likert scale. The one sample *t*-test will assist in understanding the overall student sense of

connection in their online courses and what that means to the correlation between the OSCS and

EOC scores. The one sample *t*-test results revealed a sample mean of 3.19 (*SD* = .61) which was

not found to be significantly different from 3, $t(38) = 1.977$, $p = .055$ as seen in Table 12. The

95% confidence interval for the OSCS mean ranged from 2.96 to 3.39.

Table 11

OSCS One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
OSCS	39	3.19385	.612263	.098041

Table 12

OSCS One-Sample Test

	Test Value = 3					
					95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
OSCS	1.977	38	.055	.193846	-.00463	.39232

*p ≤ .05

The results of the Pearson's *r* were found to not be statistically significant, with a

significance level of .06 with the p value set at p ≤ .05, as seen in Table 14. The one-sample

statistical analysis, found in Table 11, showed the overall student sense of connection score as

3.19 on the 5-point Likert scale. The one-sample *t*-test score analysis of $t(38) = 1.977$, $p = .055$,

seen in Table 12, shows that there is not a statistical significant sense of connectedness among all

surveyed students as seen in their OSCS overall score results.

The researcher also conducted a linear regression analysis to visually display the data and show the predictive value of the online student's EOC Milestone assessment score and their Online Connectedness Survey score. Green and Salkind (2012) report that a Bivariate Linear Regression should be used to evaluate the independent (x) variable and its relationship to the dependent (y) variable to display the relationship between two variables. In this study, the the Online Student Connectedness Survey score was the independent (x) variable, and the online student's EOC Milestone assessment score was the dependent (y) variable.

The EOC scores and OSCS survey data were calculated in SPSS and a scatterplot of the data was created as shown in Figure 5. A scatterplot is "a pictorial representation of the correlation between two variables: The scores of individuals on one variable are plotted on the x-axis of a graph and the scores of the same individuals on another variable are plotted on the y-axis" (Gall, Gall, Borg, 2007, p. 332). The bivariate scatterplot shown in Table 16 reveals how accurately the regression equation predicted the dependent variable scores.

Figure 5

Bivariate Linear Regression Scatterplot
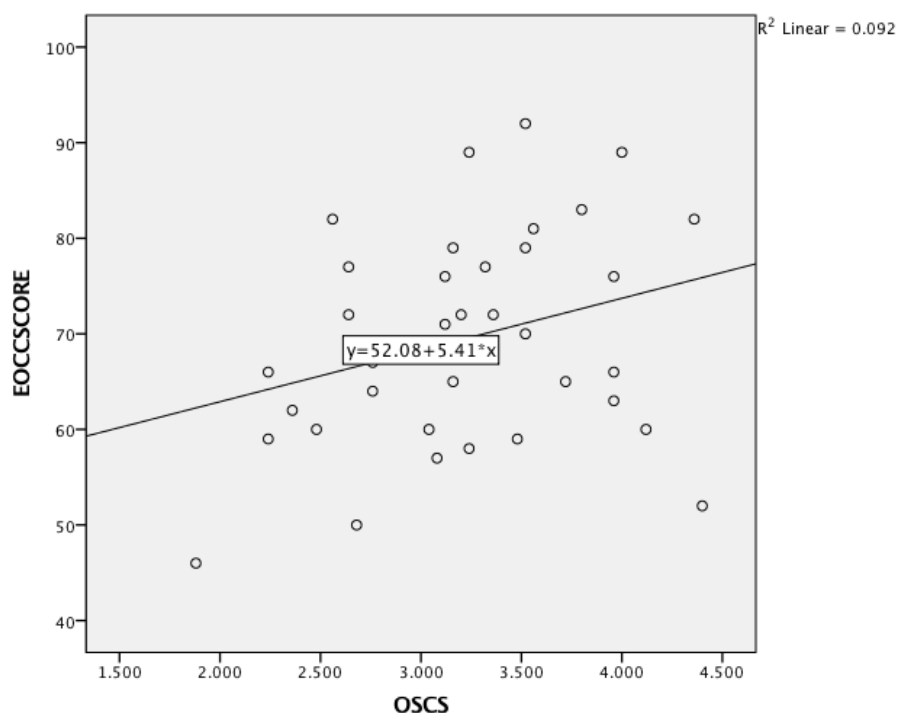
The bivariate scatterplot in Figure 5 shows the homoscedasticity of variance to be unequal around the line of fit, or the regression line, y = 0. The assumption of homoscedasticity expects the variance around the regression line for all values of the predictor variable to be the same (davidmlane.com, 2016). The violation of the assumption of homoscedasticity in the data indicates a lack of statistical significance in the correlation between OSCS and EOC scores. The fit line on bivariate scatterplot visually displays that the two variables indicate some correlational predictability, but too many of the points are far off the fit line. A significant correlation cannot be proven through the assumption of homoscedasticity.

The scatterplot, as seen in Figure 5 does, however, indicate the two variables have a positive linear relationship. The analysis of survey results reveals that a student's EOC assessment score (dependent variable) does have a positive directional correlation with the student's OSCS (independent variable). The data analysis reveals a relationship between the two variables, but the data does not show a statistically significant correlation between the EOC and OSCS scores.

The data analysis did not allow the researcher to reject the null hypothesis. The data anlyssis did not reveal a statistically significant correlation between students' OSCS score and their EOC Milestone score. Based on the lack of a statistically significant correlation between the EOC Milestone assessment score and the OSCS score when calculating for Pearson's *r*, the data from the one-sample *t*-test, and the use of a bivariate scatterplot analysis, the researcher was not able to reject the null hypothesis; there is no statistically significant correlation between students' online connectedness scores, as measured by the OSCS, and their EOC Milestone assessment scores for high school students taking a 16-week, online course via the CVA.

Summary

Upon analyzing the data, the researcher was unable to reject the null hypothesis of Research Question 1: There is no statistically significant correlation between students' online connectedness scores, as measured by the OSCS and EOC Milestone scores for high school students taking a 16-week, online course via the County Virtual Academy (CVA). The Pearson's product-moment correlation (Pearson's *r*) revealed no statistical significance found in the correlated values of EOC score and OSCS overall. The level for the correlation between EOC score and OSCS overall survey results was found at .06. The alpha level was set at $p \leq .05$. Based on Pearson's *r* analysis, there is not enough evidence to show a statistically significant correlation between the students' EOC score and their OSCS Overall survey score.

A positive linear relationship was seen in the bivariate linear scatterplot between EOC scores and the student's OSCS score, with the regression equation predicting the dependent variable scores. The bivariate scatterplot did, however, reveal a lack of homoscedasticity between the two variables. The assumption of homoscedasticity expects the variance around the regression line for all values of the predictor variable to be the same (davidmlane.com, 2016). The fit line on the bivariate scatterplot reveals that there is an unequal variance between EOC and OSCS scores, thus not allowing the researcher to reject the null hypothesis for the Research Question.

CHAPTER FIVE: DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS

Discussion

The purpose of this quantitative, bivariate correlational study was to understand the relationship between online high school students' sense of connectedness in the course, as measured by the OSCS and the students' standardized EOC Milestone scores. The data analysis for this study did not support the hypothesis for Research Question 1: There is a statistically significant correlation between students' OSCS and their EOC Milestone assessment score for high school students taking a 16-week, online course via the CVA.

In this chapter, the statement of the problem, summary of the data analysis, discussion of the overall findings, and future implications for educators are discussed. Limitations of this research study are discussed in this chapter as well as recommendations for potential future research on the subject of online learning. This chapter helps explain the gap in the research and why more research needs to be conducted on the students' experiences in the online learning environment. It is important, as online educational opportunities are improved for students in the K-12 setting, to try and understand the relationship between the students' sense of connectedness in the online setting and their success on standardized achievement scores for the online course.

Statement of the Problem

As the Internet makes online opportunities for students more accessible, educators must find out how to use this medium to engage students in collaborative, authentic learning experiences with each other. School leaders must realize that virtual options are allowing learning to take place outside of the traditional school hours and that today's student requires a different type of instructional approach because they are wired differently from past generations of students. (Sheninger, 2014). Today's student is the first in history to not need the teacher to

be the provider of facts and figures (Elmore, 2010). Meeting the online needs of students means understanding how to reach and improve our online practices and course offerings. Lichtman (2014) believes that teachers cannot continue to teach as they have in past years and must incorporate new and innovative approaches to student engagement as they help students pursue their educational goals and passions.

In the past, research shows that distance education options have revealed higher dropout and failure rates when compared to traditional course options (Hawkins et al., 2013; Roblyer & Marshall, 2003). Meeting the needs of students in this new medium of educational opportunity is paramount to helping students navigate and have success in the various forms of online learning. Lichtman (2014) believes that getting rid of the assembly line, traditional model of educating students and moving into a more collaborative, interactive model will help schools prepare students for the future workplace.

The increase in online opportunities for K-12 students is raising the bar in the quality of courses in which students participate (Roblyer, Davis, Mills, Marshall & Pape, 2008). The ability students have to connect with each other to improve their own development and achievement levels has never been greater. Roblyer et al. (2008) says that due to the fact that distance education traditionally faces much higher dropout rates than the traditional model, educators must understand what keeps students engaged in the online medium. Flipped classrooms, virtual schools, and online course options are just some of the innovative ways in which today's student can take a course without physically collaborating with their teacher and peers in the brick and mortar traditional school building (Harvey et al., 2014).

Local school districts must try and understand what type of online course design works best for K-12 students and how to help them collaborate and connect with peers in the isolation

of the online experience. A research study conducted by Borup et al. (2013) explains that future research into online options and its effect on student achievement should be conducted as educators try to understand its impact in different courses and grade levels for K-12 students. The researcher hopes the findings of this study may assist educators in understanding if a students' sense of connectedness in the online course has any relationship to their EOC Milestone assessment score as well as their perception of connectedness in the CVA EOC courses.

The Research Question asked, Is there a correlation between online students' sense of connectedness in the course and their End of Course (EOC) Milestone score? The hypothesis for the study was: There is a statistically significant correlation between students' online connectedness scores, as measured by the Online Student Connectedness Survey (OSCS) and their End of Course Milestone scores for high school students taking a 16-week, online course via the County Virtual Academy (CVA). The null hypothesis was there is no statistically significant correlation between students' online connectedness scores, as measured by the Online Student Connectedness Survey (OSCS) and their End of Course Milestone scores for high school students taking a 16-week, online course via the County Virtual Academy (CVA).

Conclusion

Research Question

The Reseach Question asked, is there a statistically significant correlation between an online students' sense of connectedness in the course and their EOC Milestone assessment score? The results of the Pearson product-moment correlation (Pearson's *r*) did not establish a statistically significant correlation between the two variables, as seen in Table 13.

Table 13

EOC and OSCS Correlation Results

		EOC Score	OSCS Score
EOC Score	Pearson Correlation	1	.30
	Sig. (2-tailed)		.06
	N	39	39
OSCS Overall Score	Pearson Correlation	.30	1
	Sig. (2-tailed)	.06	
	N	39	39

*p ≤ .05

The Pearson's *r* analysis of the correlation between the Online Students Connectedness OSCS score and their EOC assessment results revealed a *p* value of .06 with $p \le .05$ set as the significance level. A bivariate scatterplot was also created to evaluate the linear relationship between OSCS score and EOC score. The fit line on the bivariate scatterplot, as seen in Figure 5, indicates some correlational predictability, but a violation of the assumption of homoscedasticity in the data indicates a lack of statistical significance in the correlation between OSCS and EOC scores. The bivariate scatterplot reveals that too many data points are off the line of fit, thus violating the assumption of homoscedasticity. A violation of this assumption allows the researcher to establish that a significant relationship could not be shown between the OSCS and EOC score variables by the bivariate scatterplot and its data analysis.

The Pearson's *r* data analysis and the bivariate scatterplot indicate a positive relationship, but neither can confirm a significant correlation between the two variables. Based on this data analysis, the null hypothesis could not be rejected. The data analysis did not reveal a statistically significant correlation between the students' sense of connectedness as measured by the OSCS and their EOC Milestone assessment score. However, the researcher believes that future research studies are needed in order to better understand the possible relationship between the two variables as online learning is implemented in the K-12 setting. A definite area for future study is the qualitative research of students' thoughts and perceptions of the online course experience. Future qualitative studies should take place to understand student perceptions of the process and what they believe will improve their online experience.

Based on the research study hypothesis for Research Question 1, the researcher expected to find a statistically significant correlation between the OSCS score and the EOC score. Hawkins et al. (2013) found that a student's sense of community and the quality and frequency of interactions with their instructor and peers in an online course has been shown to be a major factor in the actual success the student has in the online course. Their study examined the interactions and perceptions of students in the online course setting and how that affected their academic performance in the course (Hawkins et al., 2013). The students in the study perceived positive interactions with their teacher for those who completed the course versus a negative perception of their teacher interactions for those who did not complete the course.

Beldarrain's (2008) online interaction study revealed that learner-learner interaction tends to be associated with higher achievement than the analysis of learner-teacher interaction. Zucker's (2005) research revealed the learner–learner interaction is an important piece of online student learning, but less than half of the study participants thought the interaction with their

peers assisted them in mastering the standards for the course. Borup et al. (2013) believe that

student collaboration by itself may not be responsible for the improvement in student success and

engagement in the course. They feel the instructor should continue to create and include more

collaborative opportunities for students to interact more often and help increase learning

opportunities (Borup et al., 2013).

Based on the data analysis for Research Question 1, a statistically significant relationship

was not found between the students' sense of connectedness to their peers and instructor in the

online virtual classroom and the student's mastery of course content as measured by the course

End of Course Milestone assessment. A statistically significant relationship was not found to

exist in the analysis of data for the Research Question, but the researcher believes research

studies and literature support the research hypothesis for this study and the continued research

into the area of connection in the online setting for students.

The overall OSCS overall mean score was $M=3.19$ on a Likert scale ranging from 1;

strongly disagree, to 5; strongly agree, as seen in Table 14.

Table 14

OSCS Overall Mean

N	Students	39
	Missing	0
Mean Score		3.19
Std. Deviation		.6122
Range of Scores		2.52

The researcher conducted a one-sample *t*-test on the Online Student Connectedness Survey results as shown in Table 15, to evaluate whether the mean score was significantly different from 3. The number 3 was chosen because a value less than 3 on this particular survey instrument implies a negative response to the survey questions in each category on the OSCS Likert scale. The one sample *t*-test results revealed a sample mean of 3.19 (SD = .61) which was not found to be significantly different from 3, *t*(38) = 1.977, *p* = .055 as seen in Table 18.1. The 95% confidence interval for the OSCS mean ranged from 2.96 to 3.39.

Table 15

OSCS One-Sample Test

					95% Confidence Interval of the Difference	
			Test Value = 3			
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
OSCS	1.977	38	.055	.193846	-.00463	.39232

*p ≤ .05

A neutral overall average feeling (M=3.19) of connectedness on the OSCS as seen in Table 14, should translate into an overall EOC average score. The overall EOC score mean (M=69.36) was slightly below average, but not exceptionally poor when a grade of 70 is considered passing. The researcher believes that the data did not establish a statistically significant relationship between the two scores, but the data did reveal a need for further research on the impact of a student's perception of connectedness in an online course and their academic

achievement in that medium.

The lack of a large sample size from the study's population was a limitation for this study. The researcher believed the small sample and sub-sample size for each course are both contributing factors in discovering a statistically significant correlation between the OSCS and EOC score. The small sample size led to a power analysis with a large margin of error of 15% that will limit the generalization of the study for future use. The comparison of OSCS and EOC scores did reveal some support for the original hypothesis for Research Question 1, but the data analysis does not allow the researcher to reject the null hypothesis.

Implications

The research hypothesis stated that there would be a statistically significant correlation between the students' sense of connectedness and their EOC Milestone assessment score. Data analysis from the study provided insufficient evidence to reject the null hypothesis for the study. The implementation of K-12 online learning has increased exponentially in recent years but very little research is available in the area of secondary education (Kirby et al., 2012). Borup et al. (2013) feel that as online options become increasingly more available for K-12 students, it is imperative to understand what today's student needs to be successful in the online classroom setting.

 Kim et al. (2012) mention:

A substantial number of research studies have focused on issues related to online school administration, management, or teacher competency development, but little has been done in investigating the early stage (i.e., which is perhaps the most critical period of student learning online and especially what they might think about online interaction or discussion experiences). (p. 523)

The OSCS instrument was initially developed for college students and adapted for this study to be used with high school students. As online learning for K-12 students becomes more popular and available, educators need to understand the students' perception of the experience and what can be implemented to help them be successful in this online environment. The lack of a true evaluative instrument dedicated to the high school population could account for the lack of a statistically significant correlation between the EOC and OSCS scores and is something that should be further investigated and researched. As the school district moves forward with improving their online course offerings, more information needs to be gathered from the students on what they believe needs to be done to improve their perception of these subcategories of the OSCS.

Limitations

As with any research, there weree several limitations related to the study. The limitations found within this study included the total number of participants in the study. With a small sample size (N=39) the researcher was forced to use a 15% margin of error in the power analysis of the study. The 15% margin of error allowed the researcher to keep the confidence level at 95% while maintaining the minimum number of participants at 15%, which was 36. This large margin of error was a contributing factor in ability to generalize the study for future use.

The total number of participants was directly related to the fact that the study dealt with minors who must have parental permission to participate in the research study. The ability to acquire parental consent, especially for students who are participating in online courses was extremely challenging. The acquisition of the survey data was two-fold. Parental consent had to be obtained, and then the survey also had to be completed and returned. When working with minors, data collection and reporting practices are magnified (Gall et al., 2007).

After the initial consent email was delivered to parents with almost no response back, a second option had to be utilized to try and obtain consent prior to the data collection. A study focusing on the online environment should try and use online tools to communicate and participate in the data collection. After several attempts to collect the consent and data virtually, the decision was made to use a traditional pencil and paper approach. This option was much more successful and provided enough participants to complete the research study. The anonymous nature of the survey data was also a limitation. The students could not be sent any follow-up questions after the fact to help the researcher better understand the survey data. Anonymity also limited the ability to improve the return rate after receiving the initial responses.

Participation bias was also a limitation for the study. Gall et al. (2007) define a bias as "a set to perceive events in such a way that certain types of facts are habitually overlooked, distorted, or falsified" (p. 543). With the email consent form, all parents had the ability to participate in the study, but the researcher could not account for who actually returned a survey. Only one parent responded to the email sent out by the CVA, and that parent did not complete a consent form; they only asked questions about the study.

Consent forms were then sent out to each of the high schools in the district. Local school administrators were asked to deliver consent forms to the students who took EOC courses through the CVA during the fall semester of 2015. Once the forms were sent to the local schools, there was no way to account for who received one, who took it home, and who returned a completed copy. This method of collecting survey data could not ensure a balanced return among all schools based on their percentage of students who took an EOC online course in the fall of 2015 and may have led to participation bias for the analyzed data.

One further limitation for this study was that no students took Algebra I during the fall semester of 2015 with the CVA. The Algebra I course is a major course in any school district across the county, but not one CVA student was registered for this EOC Milestone assessment course during the fall of 2015.   This lack of student participation in this online course cannot be accounted for, but its exclusion is a limitation to the study as Algebra I is a major academic course required for graduation in the state of Georgia.

The researcher had a sample population for this study that consisted of a small population of online students taking particular courses during one semester of the school year from one school district. The number of participants can limit the researcher's ability to generalize the findings of the study for future research and comparison to other similar populations (Gall et al., 2007). The researcher believes that despite the addressed limitations, this research study revealed significant findings in the area of student connectedness in the online environment for high school students. The limitations for this study have been addressed, and the data from the study reveal a need for much more research in the area of student interaction, collaboration, and overall connectedness in online courses at the high school level.

Recommendations for Future Research

This study's intent was to determine if a correlation existed between a high school students' sense of connectedness with their peers and instructor in their online class and their EOC Milestone assessment score. The study used the OSCS to assess the students' sense of connectedness in their EOC course. The overall survey and EOC scores were used to determine if a correlation existed between the two scores. Each area of the OSCS was also evaluated to realize the students' perceptions of their online experience in each course. The findings found within the study clearly show a need for further studies to be conducted to help educators

understand the relationship between students' sense of connection with their online instructor and their peers as it relates to their overall success in the online course.

Various options for high school students and the Internet's capability to connect with others at any time of the day are changing the world of K-12 education (Scarborough & Ravaglia, 2014). Online opportunities for high school students are shifting the instructional focus to the application of knowledge and skills that help students have a deeper understanding of material due to the lack of a traditional brick and mortar school setting (Elmore, 2010; Horn and Staker, 2015; and Sheninger, 2014). There is a new movement of believers in the online educational environment and, at its core, the local school should be the facilitator of information as students understand how to apply that information and to collaborate with their peers using the technology available to them (Scarborough & Ravaglia, 2014).

The online setting at the college level has been researched and the students' sense of connectedness has been shown to be a key piece to their overall success (Dixson, 2010; LaBarbera, 2013, & Milman, 2013). As students are given more options with online courses, educators must understand what students need if they are to be successful in the online environment (Lee & Figueroa, 2012). The support, course design, and project-based learning opportunities are critical pieces to helping students achieve success in an online course (Horn & Staker, 2015). It is imperative for educators to understand student needs in the online course setting as more options become available for students at the high school level. LaBarbera (2013) feels that assessing student needs and desires for their online experience will assist school districts in moving forward with finding innovative ways for students to access online courses that have never before been available.

The educational development theories of Lev Vygotsky are just as relevant, and maybe more important today than they were in the 1930's. "Both the growing racial and cultural diversity of children within the United States and the globalization of contemporary life make it imperative that we understand cultural contributions to development" (Miller, 2011, p. 170). As technology increases the ability for students' to connect (Christensen et al., 2011; Elmore, 2010; & Sheninger, 2014), understanding Vygotsky's ZPD theory and the impact it may have on student achievement in the online setting is critical.

Future studies related to this research should evaluate the student perceptions of their online experience and what students believe can be included in the experience to help them better collaborate with their peers and interact with their instructor. The primary findings of this study established through Pearson's r (p = .06, with p $\leq$ .05), there was not enough evidence to show a statistically significant relationship between students' sense of connectedness and their EOC Milestone assessment score. Recommendations for future research would include more studies which observe the students' sense of connection with their peers and instructor with a much larger population of students to help generalize the findings and lower the margin of error for the study.

Additionally, the researcher believes that qualitative studies focused on the student experience would be beneficial in future research studies (Haley, 2013; Luehr, 2011; Rankin, 2013). This information could help educators understand the thought process of the student as they work through the course, and what it is that they want from their online experience. This type of qualitative study could be information rich and assist the researcher to better understand exactly what the student feels and what they need to help them navigate through an online course.

The data analysis revealed that the students' overall sense of collaboration and interaction with peers was much lower than expected in the online environment. Understanding what can be done to improve student perception of these two areas is definitely an area of focus for future research. Future studies could also address the time students spend logged on and actively participating in their online course. Time was not accounted for in this study and could be a large factor in the success of a student in the online setting. The more educators can understand about student needs in the online setting, the better they can prepare an online experience where students can be successful.

Today's student is not restricted to physical collaboration with classmates or school friends as they learn (Daniels, 2008). Collaboration with peers from across the state, nation, and even the globe, can help learners grow in the online setting. Connection is a key piece of Vygotsky's (1978) ZPD theory and its impact on a student's growth potential. The use of online learning in the K-12 setting opens up a new world of connection where no bells end to the school day. "We can't create more minutes in a day or days in a year, but we can absolutely twist time to better meet our learning goals" (Lichtman, 2014, p. 21).

A successful implementation of online learning opportunities for students is important as more K-12 students take courses in the virtual setting (Barbour et al., 2012). Today's students have the ability to virtually connect with each other, apply information to real world scenarios and learn to creatively collaborate with their peers. These online opportunities open a whole new world of educational possibilities for all students.

Students now have almost unlimited access to their peers and instructor in the online setting. Understanding how to help students connect and the level of comfort they feel as they learn from their more capable peers is imperative to the success of the online experience

(Chandler et al., 2012).   It should be a priority for all educators to understand the best possible way to implement online options to help students apply information in authentic, real-world settings in collaboration with their peers as they grow as learners and learn to connect in today's digital society.

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(UMI No. 3332683)

Appendix A

Online Student Connectedness Survey (OSCS)

(Bolliger and Inan, 2012)

Please answer each question with a 1,2,3,4, or 5.
1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly Agree

Comfort

1. _____ I feel comfortable in the online learning environment provided by my District.
2. _____ I feel my instructors have created a safe online environment in which I can freely express myself.
3. _____ I feel comfortable asking other students in my online course for help.
4. _____ I feel comfortable expressing my opinions and feelings in my online course.
5. _____ I feel comfortable introducing myself in my online course.
6. _____ If I need to, I will ask for help from my classmates.
7. _____ I have no difficulties with expressing my thoughts in my online course.
8. _____ I can effectively communicate in my online course.

Community

1. _____ I have gotten to know some of the faculty members and classmates well.
2. _____ I feel emotionally attached to other students in my online course.
3. _____ I can easily make acquaintances in my online course.
4. _____ I spend a lot of time online with my online course peers.
5. _____ My peers have gotten to know me quite well in my online course.
6. _____ I feel that students in my online course depend on me.

Facilitation

1. _____ Instructors promote collaboration between students in my online course.
2. _____ Instructors integrate collaboration tools (e.g., chat rooms, wikis, etc.) into online course activities.
3. _____ My online instructors are responsive to my questions.
4. _____ I receive frequent feedback from my online instructors.
5. _____ My instructors participate in online discussions.
6. _____ In my online course, instructors promote interaction between learners.

Interaction and Collaboration

1. _____ I work with others in my online course.
2. _____ I relate my work to others' work in my online course.
3. _____ I share information with other students in my online course.
4. _____ I discuss my ideas with other students in my online course.
5. _____ I collaborate with other students in my online course.

Bolliger & Inan (2012). Online Student Connectedness Survey (OSCS). © Used and adapted with permission from Dr. Doris U. Bolliger, Ed.D.

Appendix B

Approval Email from the OSCS Creator

Sent: Monday, January 12, 2015 3:52 PM
To: Doris U. Bolliger [dbollige@uwyo.edu]

Thank you!

Go Bucs!

Benji Morrell
Allatoona High School
Athletic Director/Testing Coordinator
3300 Dallas Acworth Hwy.
Acworth, GA 30101
O: 770-975-6503 ext-701011
C: 404-455-8787

From: Doris U. Bolliger [mailto:dbollige@uwyo.edu]

Sent: Monday, January 12, 2015 3:30 PM   **To:** Benji Morrell   **Subject:** Re: use of survey

Dear Benji Morrell,

Thank you for contacting us and expressing interest in our work. I am not an expert in the K-12 setting;

 however, I think the scale could be modified to fit your needs. You have my permission to

modify and use the Online Student Connectedness Scale that was published in the journal

 International Review of Research in Open and Distance Learning in 2012.

Good luck with your dissertation research!

Kind regards,

Doris Bolliger

Doris U. Bolliger, Ed.D.   Associate Professor
Coordinator, Instructional Technology Program
Department of Professional Studies
College of Education   Dept. 3374, ED 322   1000 E. University Avenue   Laramie, WY
82071   Ph. 307-766-2167   dbollige@uwyo.edu

From: Benji Morrell <Benji.MORRELL@cobbk12.org>
Sent: Tuesday, December 30, 2014 3:57 PM   **To:** Doris U. Bolliger   **Subject:** use of survey

Dr. Bolliger,

I am putting together my dissertation proposal for Liberty University and wanted to ask

your permission to possibly use your online connectedness survey in my research.

Is it also applicable for use with high school students taking online courses?

 Any help you can give me would be appreciated.

Regards,

Benji Morrell

Assistant Principal

Allatoona High School

3300 Dallas Acworth Hwy

Acworth, Ga 3010

Note: "This message is intended only for the use of the individual or entity to which it is addressed and may contain information that is privileged, confidential and exempt from disclosure under applicable law. If the reader of this message is not the intended recipient, you are hereby notified that any dissemination, distribution, or copying of this communication is strictly prohibited. If you have received this communication in error, please notify us immediately by telephone and/or e-mail."

APPENDIX C: Survey Monkey Permission Letter

SurveyMonkey Inc.

www.surveymonkey.com

For questions, visit our Help Center

help.surveymonkey.com

Re: Permission to Conduct Research Using SurveyMonkey

To whom it may concern:

This letter is being produced in response to a request by a student at your institution who wishes to conduct a survey using SurveyMonkey in order to support their research. The student has indicated that they require a letter from SurveyMonkey granting them permission to do this. Please accept this letter as evidence of such permission. Students are permitted to conduct research via the SurveyMonkey platform provided that they abide by our Terms of Use, a copy of which is available on our website.

SurveyMonkey is a self-serve survey platform on which our users can, by themselves, create, deploy and analyze surveys through an online interface. We have users in many different industries who use surveys for many different purposes. One of our most common use cases is students and other types of researchers using our online tools to conduct academic research.

If you have any questions about this letter, please contact us through our Help Center at help.surveymonkey.com.

Sincerely,

SurveyMonkey Inc.

APPENDIX D: Parent Permission Letter

Dear Parent/Guardian:

Your student is invited to participate in a research study conducted by Benji Morrell, a doctoral student from Liberty University's College of Education. This study is being conducted to understand the relationship between how connected your student feels in their online course and their final End of Course Milestone Assessment score. Your student was selected as a possible participant in this study because they are enrolled in and online course through the Cobb County Virtual Academy during the fall semester of 2015.

If you decide to allow your student to participate, they will be sent an online survey consisting of 25 questions through the Survey Monkey platform. Their survey results will be collected and compared to their End of Course Assessment scores at the end of the semester.

It is the researcher's desire to use the results of this study to better develop future online courses in Cobb County. However, I cannot guarantee that your student personally will receive any benefits from this research.

Any identifying information about your student will remain confidential and will be disclosed only with your permission or as required by law. Student identities will be kept confidential by using Cobb County School District student identification numbers and the researcher will be the only person that will have access to the survey data.

Your student's participation in this study is voluntary. Your decision of whether or not to allow them to participate will not affect your or your student's relationship with the Cobb County School District. If you decide to allow your student to participate, you and/or your student are free to withdraw your consent and discontinue participation at any time without penalty.

If you have any questions about the study, please feel free to contact Benji Morrell at benji.morrell@cobbk12.org or by phone at 404-455-8787. You may also contact his faculty advisor, Dr. Alan Wimberley at awimberley@liberty.edu. If you have questions regarding your rights as a research subject, please contact the IRB (irb@up.edu). You will be offered a copy of this form to keep.

Your response to this email with a reply of, "Yes, I agree to my student's participation in this study", indicates that you have read and understand the information provided above, that you willingly agree to allow your student to participate, that you and/or your student may withdraw your consent at any time and discontinue participation without penalty, that you have received a copy of this form, and that you are not waiving any legal claim.

APPENDIX E: Permission to Reproduce the OSCS

Doris U. Bolliger dbollige@uwyo.edu
Re: Permission to reproduce the OSCS in my dissertation

Hi Benji,

Just a quick note about my last name. It does not have an "N" in it. It is simply Bolliger. Just FYI for publishing purposes.

Cheers!

Doris

From: Benji Morrell <Benji.MORRELL@cobbk12.org>
Sent: Tuesday, October 25, 2016 8:44:01 AM
To: Doris U. Bolliger
Subject: Permission to reproduce the OSCS in my dissertation

Dr. Bollinger,

Thank you for allowing me to use your OSCS in my research for my dissertation,

I am contacting you now because I would like to ask permission to reproduce your Online Student Connectedness Survey in my Dissertation. After defending my Dissertation, my program requires me to submit it for publication in the Liberty
University open-access institutional repository, the Digital Commons, and in the Proquest thesis and dissertation subscription research database. If you allow this, I will provide a citation of your work as follows:

The OSCS is reproduced here, in its entirety, with permission from Dr. Doris U. Bollinger. Dr. Bollinger's permission to reproduce the survey is not an endorsement of the products, services, or other uses in which the survey appears or is applied.

Can you please respond back to this email so I may add the information as an appendix to my dissertation?

Thank you for your consideration in this matter!

Dr. Benji Morrell