HIGH SCHOOL TEACHERS' SENSE OF EFFICACY: TRADITIONAL TEACHING VS.

TEACHING WITH A LEARNING MANAGEMENT SYSTEM

by

Kelly Yolanda Backenstoe

Liberty University

A Dissertation Presented in Partial Fulfillment

Of the Requirements for the Degree

Doctor of Education

Liberty University

2018

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ABSTRACT

Teacher efficacy has an impact on how students achieve in the classroom. There is a variety of ways teachers help students learn. For example, the method of traditional instruction includes the use of a textbook and teacher lectures. However, a current trend in education is for schools to use a Learning Management System, like Schoology, to help teachers organize and distribute resources to students. This study will help administrators understand if teachers have a stronger or weaker sense of efficacy through the use of traditional instruction or instruction with the use of Schoology. The study is important because administrators need to understand how the programs they are implementing in schools impact teacher efficacy beliefs. The purpose of this causal comparative study was to employ Bandura's theory of self-efficacy, to identify if there was a difference in high school teacher efficacy beliefs of those who teach with Schoology in their classrooms and those employ traditional methods. The researcher attained permission from the Superintendent of five school districts and high school teachers were asked to participate in the Teacher Sense of Efficacy Scale (TSES) via email. Participants completed the survey through a link in their email, and the researcher analyzed data using the MANOVA to test if each dependent variable of teacher efficacy differs significantly. The MANOVA determined that there was no significant difference among the groups in terms of their teacher efficacy. Although no significant differences were reported, the research adds to the body of literature since there are very few studies on the impact of an LMS in K-12 education.

Keywords: learning management systems, schoology, teacher efficacy, traditional instruction

Dedication

This dissertation is dedicated to my husband, Travis and our two sons Luke and Benjamin.

Acknowledgments

I acknowledge, first and foremost the impact God has had on my educational journey. From beginning a relationship with Him during my undergraduate years to fulfilling my doctorate at a Christian university, I know it has all been a part of His plan. Throughout my studies, He has given me the tools, the grace, and the knowledge to bring each degree to fruition. Additionally, He has blessed me with a supportive family and husband, who knew how important education is to me.

To my husband Travis, I express deep gratitude for your patience during my countless hours of studying. I am very blessed to be your wife.

To my parents, Robert and Beverly, thank you for always supporting and encouraging me in every path I chose. Most importantly, I am forever grateful for the example you set as hardworking individuals with integrity. I strive every day in everything I do because of your exemplary lives.

To my sister, Kristen, thank you for consistently cheering me on throughout my life. Your unwavering, positive words have always reassured me, just when I needed to hear them.

To my dissertation chair, Dr. Gary Kuhne, thank you for your constant guidance and wisdom as I pressed on through the project. Your knowledge and expertise have directed me well on this journey.

To my dissertation committee member, Dr. Terrell Elam, thank you. Your feedback during my coursework and this research has always been encouraging.

To my dissertation committee member, Dr. Jeffrey Keeling, thank you. Your advice and editing skills have been a huge asset to my project.

Table of Contents

List of Tables

List of Figures

List of Abbreviations

Individual Education Plan (IEP)

Learning Management System (LMS)

Ohio State Teacher Efficacy Scale (OSTES)

Teacher Sense of Efficacy Scale (TSES)

CHAPTER ONE: INTRODUCTION

Overview

Factors of student achievement mainly revolve around what is happening with the student; however, how well teachers feel they can successfully teach students can have an impact on student achievement as well. Teacher efficacy is one of those determinants of student success (Guskey, 1989). Since teacher efficacy influences student achievement, administrators need to understand how programs they mandate impact teacher confidence in their efficacy beliefs (Holden & Rada, 2011). Through this study, the researcher employed Bandura's (1977) theory of self-efficacy to compare teacher efficacy beliefs of high school teachers who employ traditional instruction and high school teachers who teach with the Learning Management System (LMS) Schoology. In this chapter, background information about teacher efficacy, traditional instruction, and teaching with an LMS will be reviewed as well as the problem statement, the purpose of the study, the significance of the study, and the research question for the study.

Background

Teachers' instructional strategies are changing from traditional instruction methods to technology-rich instruction methods as technology is embedded into schools (Cruz, Gálvez, & Santaolalla, 2016). The latest trend in instructional strategies is to personalize learning through the use of digital technologies (Edmunds & Hartnett, 2014). These digital technologies provide teachers with a variety of instructional options to enhance student learning (Haake, 2013). For example, an LMS is a digital tool used to create a diverse and interactive learning environment for the students; however, the effectiveness of LMS tools is dependent upon the instructor's comfort level with implementing them (Dias & Diniz, 2014). In addition to how comfortable a

teacher is with implementing an LMS, the efficacy beliefs of teachers employing digital tools is dependent upon their belief in their ability to implement technology effectively (Wang et al., 2016).

In order to address the importance of teacher efficacy, understanding the deep historical background of the theory of self-efficacy and how it relates to the field of education is important. One of the earliest researchers to study a topic similar to efficacy was Rotter (1966), who determined that people who believe they have the ability to control their success will take the necessary steps to achieve their goals. Bandura (1977) continued the impact of self-efficacy, as he explained the self-efficacy expectation as a belief that a person can exhibit the proper behavior and therefore meet the desired outcomes.

As studies on self-efficacy began to strengthen the theory, Bandura (1993) continued his research in perceived self-efficacy by addressing how it impacts cognitive development and functioning. Continued research determined that self-efficacy is different from other concepts like self-esteem because self-efficacy is about a person's perception of his or her ability to complete a task, whereas self-esteem is dependent on a person's self-worth (Tschannen-Moran, Hoy, & Hoy, 1998). Furthermore, Bandura (1993) aligned self-efficacy with student achievement when he reported that if people are in a setting where they are encouraged to focus on their own personal success and goals, the result would be acquiring more skills, and a stronger sense of self-efficacy will be created, thus leading toward greater achievement. Therefore, the aforementioned setting is the type of classroom environment teachers should create if they are going to maximize student achievement (Bandura, 1993).

When self-efficacy is applied to a difficult situation, Rotter (1966) noted people who believe they are the driving force of their success will be more resistant to others, behaviors, and

distractions that would try to derail them from success. Similar to Rotter's (1966) research, Bandura (1977) reported that the higher a person's perceived self-efficacy, the more effort a person will make toward reaching their desired outcomes, even when those people are faced with adversity. Furthermore, in a supporting study, Tschannen-Moran et al. (1998) researched teacher efficacy, and the researchers determined that teacher efficacy is a motivational concept, which is an indicator of the level of effort a teacher will give toward the students, especially toward students who struggle to learn. Tschannen-Moran and McMaster (2009) expanded on the idea that teacher efficacy is a motivator as they explained when teachers have low efficacy, they will not put forth effort to help students who lack motivation and need extra help learning.

Recognizing the importance of understanding teacher efficacy in all aspects of education led Tschannen-Moran and Hoy (2001) to create a valid and reliable tool for measuring teacher efficacy. The tool the authors developed is called the Ohio State Teacher Efficacy Scale (OSTES), also referred to as the Teacher Sense of Efficacy Scale (TSES). The amount of knowledge to be gained as a result of understanding teacher efficacy is endless through the use of this scale. More specifically, understanding teacher efficacy can impact the type of professional development, pre-service education, mentoring, and teacher evaluations.

In society, the educational trend is to integrate technology in the classroom to meet the needs of 21st Century skills (Lowther, Inan, Ross, & Strahl, 2012). The belief is the more a school increases its technological resources and communication through devices, the more potential students have to be successful (Penuel, 2006). When technology is integrated in a course, the students' abilities to learn, study habits, and collaboration are improved (Livingston, 2005). Kong (2011) determined that overall student achievement occurs through the use of technology. With technology, the learning environment will be transformed from traditional

instruction with a textbook in a teacher-focused environment to one that unites students with digital tools and content for learning; this learning environment is also student-focused (Broussard, Herbert, Welch, & VanMetre, 2014).

Moreover, although technology integration is needed in schools, teachers need a digital platform that fosters collaborative learning if technology is to be implemented effectively in the classroom (Alvarez, Alarcon, & Nussbaum, 2011). As software is developed for schools, designers should know why teachers and students need to collaborate through technology, if they are going to create the appropriate platform for collaborative learning (Alvarez et al., 2011). School districts are looking for platforms that include applications for instruction, course management, data collection, student assessment, communication, and collaboration (Yildirim, Reigeluth, Kwon, Kageto, & Shao, 2014). Learning management systems provide a platform to meet the needs of school districts (de Oliveira, Cunha, & Nakayama, 2016).

Overall, teacher efficacy increases student achievement by creating a great learning environment, where students are praised when they are successful and feel supported by their teacher when they struggle (Bandura, 1993). According to Bandura's (1993) theory of teacher efficacy, it was determined that teachers who have low efficacy toward instructional strategies are less committed to their profession and devote minimal time toward academia. Teachers who have high efficacy usually enjoy teaching and demonstrate strong confidence levels when instructing students in addition to being extremely effective at promoting student success (Guskey, 1988). In conclusion, the theory of self-efficacy (Bandura, 1977) was employed to determine differences in teacher efficacy among high school teachers who employ traditional instruction to high school teachers who teach with the LMS, Schoology.

Problem Statement

Schools are under pressure to incorporate the latest technologies to meet the needs of 21st Century education (Levin, 2015). Research of how well K-12 schools are upgrading their technology to be able to provide the platform for students to gain 21st Century skills and personalized learning experiences is scarce (De Smet, Schellens, De Wever, Brandt-Pomares, & Valcke, 2016). As schools try to meet all of these needs, teachers are faced with the task of implementing new technology initiatives and programs (Mei Lick & Su Luan, 2015). One specific program that schools are integrating into classrooms are LMSs (Cidgem & Ozturk, 2016).

LMSs have been utilized in higher education for over a decade; however, the introduction of LMSs in K-12 education is becoming more prevalent. As technology is integrated, K-12 schools have adopted LMSs, similar to the platforms higher education institutions have been using over the last decade (De Smet et. al, 2016). Many schools are transitioning teacher instructional methods from traditional instruction to teaching with an LMS. Current research on the use of LMSs in higher education is prevalent; however, research on high school teacher efficacy is limited and understudied (De Smet, Bourgonjon, Wever, Schellens, & Valcke, 2012). The problem is, as a result of 21st century learning expectations, school administrators are obliging teachers to utilize LMSs in the classroom without considering the impact of the LMS on teacher efficacy.

Purpose Statement

The purpose of this causal comparative study was to employ Bandura's (1977) theory of self-efficacy, in order to determine if there is a difference in teacher efficacy beliefs of high school teachers who implement the LMS, Schoology and those who do not. The study assisted

in determining if teacher efficacy differs between the groups to help better understand the impact of implementing an LMS on teacher efficacy. The independent variable in this study was teachers: high school teachers who employ traditional instruction and high school teachers who teach with the LMS, Schoology. The dependent variable in this study was the participants' posttest scores on the Teacher Sense of Efficacy Scale (TSES), which measures the strength of teacher efficacy (Tschannen-Moran & Hoy, 2001). High school teachers in five Pennsylvania school districts were surveyed using the TSES. The researcher analyzed the responses to the survey and concluded that the participants did not significantly differ on teacher efficacy overall, teacher efficacy in student engagement, teacher efficacy in instructional strategies, and teacher efficacy in classroom management.

Significance of the Study

The integration of technology in the classroom has changed the way in which students are learning. As technology is implemented in K-12 schools, teachers' instructional strategies are changing as well. The learning process is transforming into a new social learning process where students are participating in Learning Management Systems (LMS) that give students access to unlimited information, promote interaction with content, peers, and teachers, and actively involve students in the learning process (Avogadro, Calegari, & Dominoni, 2016). More specifically, LMSs that were first implemented in higher education are being filtered into K-12 education. Prior research indicated that teachers' engagement with students as well as their efficacy beliefs influence the quality of their teaching (Holzberger, Philipp, & Kunter, 2014). Therefore, understanding how efficacious a secondary teacher feels about their ability to teach with an LMS is vital to this study. This study contributes to the already existing body of

literature because it focuses on high school teachers teaching grades nine through twelve, whereas, most LMS studies are conducted in the higher education setting.

Theoretically, this research adds to Bandura's (1977) self-efficacy theory as the theory will be utilized through the surveying of the TSES scale, which has demonstrated high validity and reliability (Tschannen-Moran & Hoy, 2001). Most recently, Miller, Ramirez, and Murdock (2017) reported teacher efficacy while using a variety of instructional strategies, like technology, need further research. Saine and West (2017) conducted a study on teacher efficacy beliefs using only an LMS with students and noted that future studies should research teacher efficacy and a combination of face-to-face and synchronous learning with an LMS. Therefore, the results from this study contribute to the body of teacher efficacy literature.

The practical application and the significance of this study are that Instructional Technology departments and administrators can use the results to determine whether LMSs are a tool that they want to implement in their district, based on the findings. The results of this study can assist administrators in creating professional development opportunities for educators based on which method of teaching reported a greater sense of efficacy. Battersby and Verdi (2015) determined that providing the proper professional development sessions for educators will help teachers employ best practices with their students, improve teacher efficacy, and engage teachers in the process of continuing to be lifelong learners.

Research Question

This study is designed to answer the following research question (RQ):

RQ1. Is there a statistically significant difference in high school teachers' sense of efficacy (e.g. student engagement, instructional strategies, and classroom management), as measured by the Teacher Sense of Efficacy Scale (TSES) based on traditional instruction or teaching with the Learning Management System (LMS), Schoology?

Definitions

1. *High School Teachers* – Educators who teach students in grades 9, 10, 11, or 12.

2. *Learning Management System* – An online management tool for educators to teach and track student progress (Edmunds & Harnett, 2014)

3. *Self-efficacy* – A person's belief if one is capable of completing steps in order to meet a goal (Bandura 1997).

4. *Teacher Efficacy* – A teacher's belief in their effectiveness at their profession (Rahgozaran & Gholami, 2014).

5. *Traditional Instruction* – Education where students are instructed in a face-to-face setting with the teacher directing student learning. Lecturing, classroom activities, and discussions are all led by the teacher (Staker & Horn, 2012).

CHAPTER TWO: LITERATURE REVIEW

Overview

This literature review identifies teacher efficacy, the use of Learning Management Systems (LMS) in schools, teacher efficacy while using technology in the classroom, instruction with Schoology, and traditional instruction. More research is needed to understand teacher efficacy and the use of an LMS in the secondary education setting. Specifically, research should study teacher efficacy in traditionally-instructed classrooms as compared to teachers who utilize an LMS.

Theoretical Framework

Teacher efficacy is paramount if teachers are going to create a student-centered classroom because the more effective a teacher feels in the classroom, the more he or she is focused on students and less on him or herself (Kilday, Lenser, & Miller, 2016).   Bandura (1977) is one of the main theorists who developed and analyzed the theory of self-efficacy. Bandura (1997) explained self-efficacy as how well a person believes in his or her ability to complete steps in order to achieve a goal. Furthermore, teacher efficacy is defined as how well teachers believe that they are effective at their profession, that is helping students achieve (Rahgozaran & Ghloami, 2014). Bandura (1993) emphasized that teachers need a strong sense of efficacy in order to motivate students and foster learning in their classrooms. Collectively, school faculty need a strong sense of efficacy if they are going to mobilize students to attain their highest level of scholastic achievement.

The theory of self-efficacy developed from Bandura's (1977) social learning theory. Bandura's (1977) study determined that perceived self-efficacy can predict how successfully a person will perform a task. Moreover, how efficacious people believe they are can impact how

they meet their goals, behave, think, and motivate themselves (Bandura, 1993). Self-efficacy is also impacted by the perceptions of the level of difficulty of the task, resources available, or assistance needed in order to complete the task successfully (Bandura & Adams, 1977). The amount of time and effort it took to achieve the goal also impacts self-efficacy (Bandura & Adams, 1977). The variety of feelings on these factors can alter perceptions of self-efficacy per individual and ultimately, as a collective group.

There are four processes that are produced as a result of self-efficacy beliefs including: cognitive, motivational, affective, and selection processes (Bandura, 1993). The cognitive process is concerned with self-efficacy because the higher the goals people set for themselves, the more that people are committed to pursuing their goals. When people are full of self-doubt, they will have weaker feelings of self-efficacy, thus leading to failure to complete their goals (Bandura, 1993). The motivational process explains how people pursue their goals only if they believe they have the capability to attain them (Bandura, 1993). A person's commitment to pursuing their goals is lethargic and weak if they do not believe they are competent or proficient to achieve them. Affective processes impact perceived efficacy because if a person cannot control his or her stress level and continuously dwells on danger or negative thoughts, then perceived self-efficacy will be lower because the person cannot cope with the stressor (Bandura, 1993). Stressors and overall stress level impede goal attainment because the person is consumed with negativity instead of focusing on how to achieve the goal. Because people have different experiences throughout their lifetimes, these experiences can impact perceived self-efficacy among people differently (Bandura & Adams, 1977).

The theory of self-efficacy has informed the literature on the topic of teacher efficacy in terms of those who have a strong sense of efficacy and those who have a weak sense of efficacy.

Teachers who have a weaker sense of efficacy have higher anxiety levels; however, this anxiety can be reduced by fostering a stronger sense of efficacy (Bandura, 1993). Additionally, teachers who have a lower sense of efficacy will not tackle difficult tasks, but instead they will try to avoid them. The personal goals of a teacher with a low sense of efficacy are set very low and the teacher has a weak commitment to attaining the goals they are pursing. As they try to reach their goals, they focus more on their personal weaknesses, difficulties along the way, and how much effort is required to reach their goals. The teachers perceive that their failures are the result of their own inadequacies, which lowers their sense of efficacy even further (Bandura, 1977). Ultimately, students suffer most when they are taught by teachers with a weak sense of efficacy because students' own perceived self-efficacy weakens as well as their own personal expectations and goals for academic achievement (Bandura, 1993).

A stronger sense of efficacy is found in teachers who set high goals to master tasks successfully. These teachers do not avoid difficult tasks, but instead embrace them and perceive difficult tasks as an opportunity to attain mastery (Bandura, 1993). When people perceive that their failures are a result of situational factors, instead of personal inadequacies, then their perceived efficacy is not affected and will remain strong (Bandura, 1977). There are constantly interruptions and situations in a school environment that are out of the control of the classroom teacher. The need for teachers to be flexible and open to change and difficult situations is imperative. Therefore, schools need teachers with a strong sense of efficacy, who have confidence in their abilities, where setbacks do not overwhelm them, and instead, teachers use the setback to reflect on how to improve their effort.

Self-efficacy is related to teaching helps teachers feel empowered and they are able to build resiliency and confidence in their ability to teach (Ozer & Bandura, 1990). In Bandura and

Adams' (1977) study, the researchers determined that perceived self-efficacy is a strong

predictor of performance of tasks. Therefore, teachers will be more successful completing their

tasks on a daily basis if their perceived sense of efficacy is high.

Classroom environments are a direct reflection of the talents and sense of efficacy of the

teachers who create them (Bandura, 1993). Three areas that help determine teacher efficacy in

the classroom include behavior management, inclusive practices, and instructional management

(Zee & Koomen, 2016). Characteristics that contribute to highly effective teaching and teacher

efficacy should be studied if learning opportunities are going to occur and if students are going to

be successful (Shoulders & Krei, 2015). Therefore, the type of teaching strategies teachers

employ with their students needs continued examination (Zimmerman, Bandura, & Martinez-

Pons, 1992). Although most instructional practices are helpful in increasing student

achievement, sometimes teachers feel ineffective at implementing the strategies (Zee & Koomen,

2016). Because teacher efficacy impacts student achievement, studies on teacher efficacy and

the factors that impact it are needed to better understand how to improve teacher efficacy.

By studying teacher efficacy and how different instructional strategies impact a teacher's

feelings of efficacy, research can extend Bandura's (1977) theory of self-efficacy since the

results of the study confirm the teaching strategies that help a teacher feel most efficacious in the

classroom. This study adds to the theory of self-efficacy because new technologies are

constantly emerging, such as Learning Management Systems (LMS). These LMSs require time

and skill for teachers to learn in order to implement them effectively in the classroom. Because

the LMSs will require teachers to persevere through the difficulties that may arise in

implementing new technology in their classrooms, this study could add to the existing literature

about self-efficacy through performing specific tasks.

Related Literature

Teacher Efficacy

With the pressure teachers have to educate students of all abilities in the same classroom at the same time, it is necessary for teachers to have high efficacy beliefs in their personal and teaching abilities if they are going to help students meet their highest level of achievement (Dixon, Yssel, & McConnell, 2014). With all of the different needs that teachers must meet, teaching is absolutely a stressful job (Atiles, Gresham, & Washburn, 2017). More specifically, Aloe, Amo, and Shanahan (2014) explained that teacher efficacy is multi-faceted and is defined as how well teachers believe that that they can teach all of the students including the students who are not motivated to learn and the students who display behavioral issues in the classroom. Moreover, demands of curricula are increasing as teachers are tasked with increasing students' high stakes test scores as well as fostering student skills so they meet the standards of twenty-first century employers (Weisman, 2016).

In order to educate the twenty-first century student, a teacher must possess efficacy in teaching, managing, communicating, counseling, and problem solving with students as specific to their content (Kaur, 2016). Additional demands that teachers must meet include providing a welcoming, safe environment for the children to thrive, all while managing student behaviors, administering assessments, and providing specially-designed instruction and tailored coursework to students who have an Individual Education Plan (IEP), disabilities and a variety of other issues (Atlies, Gresham, & Washburn, 2017). Because of the vast needs teachers have to address throughout the school day, teachers' efficacy beliefs impact their ability to follow through on their work and influence students to help meet their goals (Aðalsteinsson, Frímannsdóttir, & Konráðsson, 2014).

Teachers and students learn content differently and have varied learning goals. Strategies that work for some students may not work for others. Although the objectives for a class are the same, how the content is learned varies from student to student. Teachers work tirelessly to create lessons, curricula, and authentic learning opportunities that increase student motivation and inspire students in hopes of increasing student achievement (Wiesman, 2016). Teachers who understand that students in the classroom are uniquely different, work toward understanding their students in order to meet their needs (Aloe et al., 2014). Teachers who have a strong sense of efficacy tend to give more effort and assistance to lower achieving students as compared to teachers who have a weaker sense of efficacy (Nurlu, 2015). Teachers who think that there is not much they can do to help low-achieving students, often have a lower sense of efficacy about their instructional practices (Aðalsteinsson et al., 2014).

While efficacy is important for people to be successful in their desired actions, people also need to possess the skills that are necessary to perform tasks efficaciously (Bandura, 1977). Therefore, teachers must constantly work on refining their teaching craft in the ever-evolving field of education. Within each class of students, modifying lessons, tailoring coursework to each student's ability, and utilizing differentiated instruction ultimately leads students to reach their greatest level of success (Dixon et al., 2014). When differentiated instruction is not utilized, a teacher looks at a classroom where some students are bored, some students are lost, and some students are following along.

To help increase student engagement, teachers should focus on designing lessons and activities that maximize student interest and spark student curiosity (Wiesman, 2016). Specifically, cognitive activation should be used by teachers to help students activate deep thinking through a variety of challenging tasks where students must use their prior knowledge

and address conflicts in their thinking, all while analyzing different concepts, posing solutions, and reflecting on interpretations (Künsting, Neuber, & Lipowsky, 2016). There is a strong relationship between high teacher efficacy and positive beliefs in utilizing beneficial instructional strategies (Rogers-Haverback & Mee, 2015; Künsting et al., 2016). Moreover, each group of students is missing out on the opportunity to reach their highest level of success in that course because meeting the needs of the students was not something the teacher had confidence in doing (Zee & Koomen, 2016).

When teachers have confidence in their ability to teach students successfully, their efficacy has the ability to impact student success (Sandholtz & Ringstaff, 2014). Teachers with high efficacy will challenge all students appropriately, impose high expectations on themselves as well as their students, and have students who are actively participating in the classroom (Wiesman, 2016). Bandura (1977) noted that when a person has a successful outcome after facing a difficult obstacle, such as meeting the needs of all students, then that person's sense of efficacy is validated and grows stronger.

Teachers with strong feelings of efficacy employ classroom management strategies and instructional strategies in the classroom that will provide equal learning opportunities for all of the students (Callaway, 2017). The results of Künsting, Neuber, and Lipowsky's (2016) study indicated that teacher efficacy could predict the teacher's classroom climate and classroom management over a three-year period. Therefore, teachers who do not effectively manage their classroom, will lose instructional time for the students and will be ineffective at helping educate all students based on their personal needs (Brouwers & Tomic, 2000). When teachers manage their classroom successfully, the number of student disruptions is minimized, leading to a decrease in disciplinary issues and increased opportunities for learning (Künsting et al., 2016).

Teachers who report low levels of efficacy regarding classroom management will continuously feel ineffective at maintaining order and will stop trying to manage the disruptive students (Brouwers & Tomic, 2000).

Overall, how a teacher thinks and feels can be influenced by teacher efficacy beliefs (Rogers-Haverback & Mee, 2015). For example, another impact that teacher efficacy has on a child's education is that it can influence whether teachers take responsibility for improving student achievement or if the teachers will blame low student achievement on other influences (Nurlu, 2015). Nurlu's (2015) study found that when teachers have a higher sense of efficacy, they feel more accountable for student success and failure in the classroom. Teacher efficacy impacts the teacher's words and actions in the classroom, as well as the achievement level of the students, and ultimately, students prefer learning from teachers who have higher efficacy beliefs than from teachers with lower efficacy beliefs (Kaur, 2016).

Contrary to teachers with a strong sense of efficacy, teachers who lack confidence in their teaching ability will discard the latest strategies and may quit teaching because they cannot overcome the struggle to teach using the best practices in education (Power, Cristol, Gimbert, Bartoletti, & Kilgore, 2016). Teacher efficacy is cyclical in that if a teacher has a low level of efficacy then this leads to a teacher putting forth less effort and persistence, which ultimately leads to a decrease in performance and an even lower sense of efficacy (Brouwers & Tomic, 2000). Insecurities can overwhelm an educator who has low feelings of efficacy and lead them to burnout.

Moreover, when people do not have a strong sense of efficacy in their jobs or any situation, they will remove themselves from those difficult situations that they are unable to control successfully (Bandura, 1977). O'Brennan, Pas, and Bradshaw's (2017) study determined

that the faculty felt less burnout when they believed that they had the ability to meet the needs of their students and felt connected to the school community overall. Teacher efficacy, productivity and job satisfaction increase in an environment where the school community is supportive, cooperative, and open to sharing ideas (Aldridge & Fraser, 2016). Furthermore, the more efficacious a teacher feels, the more likely a teacher will stay in the field of education (Aloe et al., 2014; Hemmings, 2015).

As education changes with innovation and research, teachers will need to change their methods and implement best practices in education. The efficacious teachers are those who will follow trends in education, experiment with the changing aspects of education, and incorporate the latest technologies and methods in their classrooms (Kaur, 2016). Schools that support best practices in education by providing quality professional development opportunities for staff, including relationship building and skill building among faculty, can increase efficacy and overall staff connectedness (O'Brennan, Pas, & Bradshaw, 2017). Research on teacher efficacy and studying the impact professional development has on teachers will help school administrators learn how to provide training sessions that teachers need in order to ultimately provide the best strategies of teaching and learning to the diverse learners that teachers work with every day (Yoo, 2016).

Power, Cristol, Gimbert, Bartoletti, and Kilgore's (2016) study determined that administrators who design professional development sessions must focus on ways to increase the teachers' perceptions of their efficacy while incorporating the new strategies being taught. By focusing on teachers' perceptions of their efficacy, teachers will be more likely to implement the new technological strategies and interfaces in their classrooms from the professional development. Additionally, Künsting, Neuber, and Lipowsky's (2016) study recommended that

professional development should focus on improving teacher efficacy because it can impact teachers' instructional behavior for many years. Although teachers should constantly be refining and updating their teaching strategies, Hammack and Ivey's (2017) study determined that teachers need to have mastery experiences in the classroom if they are going to have strong feelings of efficacy. Thus, professional development options must be offered to help teachers improve efficacy beliefs and implement instructional strategies that lead to mastery experiences.

Learning Management Systems

In recent years, researchers have been studying the benefits that information and communication technology bring to the educational world of teaching and learning (Wong, 2016). As a result of these benefits, the learning process and types of methodology used in engaging students is evolving (Altemueller & Lindquist, 2017). The transition from teacher-centered learning to student-centered learning is changing as information and communication technologies are integrated in classrooms (Islam & Grönlund, 2016). Students and teachers now have a variety of technological tools at their fingertips for use in the classroom and at home, including mobile devices such as tablets and laptops (Mbuva, 2015). A Learning Management System (LMS) is an example of this change in pedagogy that supports mobile learning and enhances effective teaching and learning (Mbuva, 2015).

An LMS is an online, digital program that is used by teachers and students to provide support for the teaching and learning experience (Edmunds & Hartnett, 2014). There are a variety of LMSs that exist for use in K-12 schools, and some examples include Google Classroom, Edmodo, and Schoology (Kompar, 2016). The LMSs help teachers electronically document, file, track, report, and teach content through one location (Murray, 2015).

Researchers de Oliveira, Cunha, and Nakayama (2016) identified the purpose for LMSs in K-12 education because the technology coordinators of school districts and educational institutions needed to manage a variety of activities and procedures that teachers wanted to implement in their classrooms. Since the millennium, Learning Management Systems (LMS) have been a staple in higher education instructional management. With the success that higher education has had in utilizing LMSs with faculty and students, now LMSs are being implemented in K-12 educational environments. As LMSs collect a plethora of data from students and teachers, they offer an opportunity for schools to look at how students learn and how faculty teach; thus, schools can make decisions on educational policies and instructional practices as a result (Lochner, Conrad, & Graham, 2015). LMSs could be the answer to meeting organizational challenges that face educational institutions today and ultimately change the way instruction is presented (Altemueller & Lindquist, 2017).

While utilizing an LMS, the collaborative features and opportunities for staff, students, and parents to communicate is easy and efficient. The design of how course materials can be organized is a key feature of an LMS as it is the location for all teacher resources and activities to be disseminated to the students both during school and outside of school (Gonzalez, 2014). For example, these LMSs provide a one-stop hub for schools to communicate with stakeholders, organize coursework, and offer a platform for collaboration. Collaboration can occur between parents, teachers, and students as schools work to help pupils achieve their highest levels of success.

LMSs are a result of the ever-evolving profession of teaching and the current educational climate as it keeps the pace of societal changes and incorporates technological advances (Haake, 2013). Instead of teachers spending time making copies and organizing student work, teachers

who use an LMS in their classroom focus their time on the students as the LMS sends assignments out to students and organizes their work in a manner that makes grading an easier task for teachers (Murray, 2015). Additionally, the creators of LMSs understand the importance of keeping education on track with technological changes, and they integrate a variety of internet-based content to work smoothly with their platforms. Content from popular educational sites like Khan Academy, Ted-ED, PBS Learning Media, and Google Apps can be linked through LMSs to seamlessly deliver content to students through one location (Kompar, 2016).

While, there are many different LMSs for K-12 institutions to implement, studies have been conducted to determine what components of an LMS help students perform the best. K-12 students are fluent in the digital world and expect their educational learning to include technology (Turel, 2014). LMSs provide an avenue for personalized learning, where students' interests and needs of remediation and enrichment can be met (Edmunds & Hartnett, 2014). Most students are attracted to technology outside school; therefore, the LMS is perfect for students. Because LMSs have similar interfaces to social media accounts, the LMSs appeal to students and they desire to interact with the features for academic purposes (Gonzalez, 2014). Similar to what students are used to outside of school, there are apps that teachers can load onto LMSs to help students review course material. Students also have the option to add the LMS to their tablet or other device so that they can be notified when course content, grades, and messages have been posted on their LMS account.

Communication increases among teachers, students, and parents through the use of an LMS. Teachers and students can communicate via the direct messaging system, or teachers can post a message for the whole class to view on individual course pages. Students also have the option to comment on teacher posts and student posts, and students can share their emotions

about a post by using the 'like' button option. Additionally, within each course, the LMS has the capability for students to post questions for their classmates to answer. Overall, the information about courses and messages from teachers posted to the LMS mimic social-media news feeds.

Students have organizational assistance when using an LMS because there is a calendar with due date postings that is managed by each individual teacher. Club advisors and administrators also use the LMS to post upcoming events and reminders for students. The LMS gives students a unique learning opportunity where they begin to advocate for themselves by communicating directly with the teacher, take control of their learning by using the Apps, review and reflect on the work of their peers, and follow their progress on the LMS through the digital content.

An essential purpose of an LMS is to help students achieve a high level of academic achievement through personalized learning (Cruz, Gálvez, & Santaolalla, 2016). Personalized designed instructional goals embedded within courses for students call for instruction that is specific to the learners and the LMS has the framework for helping students achieve these goals by making students responsible for taking information and generating a product that applies their learning (Hsu, Wang, & Runco, 2013). When technology is used with best instructional practices, students will meet a variety of curricular, communication, and technology goals (Turel, 2014).

According to De Smet, De Wever, Schellens, and Valcke's (2016) study, when students learn through an individual learning path, they retain more knowledge, and computer-based instruction provides that avenue for students to succeed. Moreover, in Dias and Diniz's (2014) study, the researchers concluded that students' interest in learning online is heightened through the use of an LMS because it is an interactive environment that offers a diverse amount of

resources and approaches to learning, thus increasing student motivation for self-directed learning. The use of an LMS provides students with a differentiated learning experience because of the variety of activities the LMS offers (Dias & Diniz, 2014). Moreover, because LMSs are on a digital platform, they are constantly updating their features in order to enhance the teaching and learning experience for students and teachers (Lochner et al., 2015). Benefits of students using an LMS include improved task efficiency, quality of work from students, student accountability, and student remediation and enrichment opportunities (Tilton & Hartnett, 2016). Moreover, through the use of an LMS, there is a variety of strategies for students to collaborate, and it incites high levels of active participation through the digital platform (de Oliveira et al., 2016).

Aside from meeting the personalized learning goals of students, LMSs parallel the world which holds students' interest. As the Internet has provided endless amounts of information at the fingertips of those who browse the Wide World Web, an LMS can connect students with an array of activities that already exist on the Internet. The difference between students accessing the Internet and using an LMS is that the teacher can select websites and post specific information to the students or groups of students based on their individual goals and needs. In Dias and Diniz's (2014) study, students reported that the more teachers move from traditional learning practices to the use of an LMS, the more satisfied, motivated, and interested students are in their learning. Students will not be bored in the classroom because they can move at a pace that is appropriate to their learning goals (Cruz et al., 2016). By bringing the digital world, which students are so attached to outside of school, into schools, students will be more enthusiastic about how they will be learning (Dias & Diniz, 2014).

Edmunds and Hartnett's (2014) study concluded that because students post information frequently on the LMS, it helps teachers gather data about what students know and what content students need to master. In a traditional classroom, when students turn in work, their teacher returns it to the student, and it resides in the student's notebook. With an LMS, the student's digital work is saved and can be seen by students and parents at any time for review. Additionally, students are able to submit assignments and questions to their teacher at home, in school, or anywhere they have Internet access, which is a significant benefit to the more traditional way of turning in papers only when students are present in school (Mbuva, 2015).

LMSs are advantageous for teachers too because they give teachers an in depth look at a variety of perspectives of student work since teachers can view student learning as it is occurring (Azpiazu, Dragovic, Pera, & Fails, 2017). Therefore, the opportunities an LMS offers for teachers to help students meet their educational goals through enrichment and remediation, also assists in creating a personalized learning environment for the students (Scott & Meeussen, 2017). For example, the reward systems that LMSs have can help teachers praise students for purposes such as participation, attendance, timely submitted assignments, etc.

Pedagogy through the use of an LMS has transformed the classroom setting (Mbuva, 2015). The LMS acts as a hub for each course. Students no longer have to wait to return to school to gather their assignments. Absent students can log in to the LMS from home to see what assignments, links, and other resources the teacher posted for the day. Furthermore, items that are saved in the LMS include, projects, portfolios, tests, discussions, quizzes, and many others. LMSs have the capabilities for students to collaborate inside and outside of the school environment, as well as aid in providing individualized learning, and track student progress

(Yildirim et al., 2014). To the benefit of parents, students, and teachers, tracking student progress, attendance, and class content is all in one location on the LMS.

The LMS environment hosts subject content in a variety of interactive features by embedding assessments, videos, and digital learning activities, all of which present a more dynamic learning experience compared to a traditional textbook (Xie, Kim, Cheng, & Luthy, 2017). Teachers are able to evaluate student work as students are developing their assignments. Therefore, teachers can give frequent feedback. Teachers can use the LMS to help learners of all abilities; whether the student needs remediation or enrichment, all learning goals can be achieved and adjusted in the coursework posted to the LMS (Cruz et al., 2016).

When an LMS is used in the classroom, the teacher helps facilitate student learning, rather than delivering the content to the students (Edmunds & Hartnett, 2014). Teachers are becoming more interested in incorporating online learning resources in their instruction because they are recognizing that technology is a vibrant tool where students and teachers can collaborate, teachers can dynamically teach, and students are a part of an enhanced learning experience (Anshari, Alas, & Guan, 2016). The teacher now moves into a facilitative role as students collaborate online and they debate on the discussion boards (Scott & Meeussen, 2017). Thus, teaching, learning, and assessing occur at the same time. The learning process is fluid.

The latest movements in technology education are supported in the LMS, since blended learning and flipped classrooms can be created and posted in the LMS (Scott & Meeussen, 2017). There are a variety of online learning resources that can be disseminated to a class through the LMS, which are meant to improve the quality of teaching and learning in the classroom. These resources will usually increase students' academic achievement because they are being created by some of the greatest academic institutions in the world (Anshari, Alas, &

Guan, 2016). Now the learning environment changes into a collaborative sharing environment because teachers and students are contributing and embedding digital resources on the LMS (Von Bitter & Turley, 2016). Additionally, as activities and courses are developed on the LMS, they can be archived to be used the following year.

The discussion boards on the LMS improve the participation and collaborative work from the students. Debates can occur through the discussion boards on the LMS, and students learn how to communicate appropriately using scholarly thought. Through their use, the discussion boards in the LMS have improved students' critical thinking and problem-solving skills (Mbuva, 2015). The discussions allow students to read what all of their classmates think and respond with counter arguments. Not only are students achieving more in the classroom, but the whole academic community has improved (Cruz et al., 2016).

Teacher Efficacy and Technology

Teaching with technology is the expectation for 21st century education. As globalization rapidly develops the world, the need for educational environments to develop students with the skills necessary to thrive is urgent (Suana, Maharta, Nyeneng, & Wahyuni, 2017). In order for teachers to prepare students for the future workforce, there has been a shift from teacher-centeredness to learner-centeredness in 21st century education (Ardi, 2017). Levin (2015) described how the United States does not match up with competing countries, in terms of student achievement; therefore, changes in how 21st century skills are embedded in education need to take precedence in America's schools. Kale and Goh (2014) explained the expectations of 21st century skills in education as necessary for students to participate actively in the competitive global world where innovation, intelligence, and collaboration are critical to being productive and successful members of society. Additionally, in order to create a workforce in the United

States that can effectively contribute to the world's workforce and compete with other countries' businesses, it is necessary for classrooms to adapt with technology to meet these needs (Levin, 2015).

The benefits of using technology effectively in the classroom include meeting literacy, mathematic, communication, and technology goals (Turel, 2014). Overall, technology is woven throughout students' daily life and needs to be a part of the educational environment, as well. Because students are communicating with their peers through a variety of technologies outside of school, teachers are often interested in online teaching, which offers a similar platform to how their students are used to interacting (Anshari, Alas, & Guan, 2016). The technological learning activities that teachers design should help students develop 21st century skills (Suana, Maharta, Nyeneng, & Wahyuni, 2017). Moreover, when teachers successfully incorporate technology into their lessons, students' motivation increases (Sahin, Top, & Delen, 2016).

Although a majority of teachers know education without technology, the latest generation of teachers grew up in the digital world. Moreover, technology in schools is constantly changing because the students and young faculty are the 'digital natives' in comparison to the veteran teachers (Anshari, Alas, & Guan, 2016). Comfort levels concerning incorporating technology and implementing 21st century skills with their students differ among teachers (Prensky, 2001). Often times, teaching staff members may become complacent with their teaching strategies and are not interested in learning how to use technology and integrate it in their classrooms (Keengwe, 2015).

Teachers have an important role in implementing technology effectively in the classroom, and more than ever, administrators need to understand teacher concerns for how they will adopt and implement these innovations (Lochner et al., 2015). When school districts mandate teachers

to use educational technology daily, it is necessary for administrators to understand which factors would influence a teachers' level of acceptance of the technology into their classroom (Wong, 2016). How well teachers adopt new technology in their classroom and their interpreted value of the technology will determine the educational experience that students have while using it (Lochner et al., 2015). The results of Woodcock, Sisco, and Eady's (2015) study determined that teachers need to have positive efficacy beliefs about teaching with technology if they are going to use it effectively with their students. Therefore, a teacher's beliefs, habits, and confidence levels directly influence how successfully echnology will be implemented in the classroom (EL-Daou, 2016).

In schools, some teachers feel confident with technology in the classroom, while other teachers are still uncomfortable using technology and having their students use it as well. It is difficult for some teachers to change the methods they have always used in teaching and make the change to implementing a new technological tool (van Deursen, ben Allouch, & Ruijter, 2016). Teachers feel a higher sense of efficacy while using technology in their classroom if they have used technology for most of their lives (Turel, 2014). If a teacher has not had a lifelong experience using technology then his or her perceptions about technology may be different than someone's who grew up in the digital world, as teachers' experiences influence their beliefs and perceptions of technology (Rahgozaran & Gholami, 2014). Since younger teachers have more experience adapting technology to their lives than older teachers, younger teachers may integrate technology in their classroom with greater ease than the older teachers (Sahin, Top, & Delen, 2016). With many of the "Baby Boom" teachers retiring and younger, technologically-advanced teachers replacing them, implementing technology in K-12 schools may become easier and the

overall sense of efficacy among faculty members may increase as a result (Pierce & Cleary, 2016; 2014).

Kale and Goh (2012) suggested the need for studying K-12 teachers in regards to their feelings and experiences when working with technology and their students. Simply growing up with technology does not ultimately make teachers comfortable with using it in the classroom, nor does it mean that an experienced teacher who did not grow up with technology would not be interested in incorporating technology with their students (Sahin, Top, & Delen, 2016). A variety of determinants including a teacher's age, gender, years of experience, grade levels taught, and courses taught impact a teacher's efficacy in teaching, their commitment to teaching, and their motivation for teaching (Chung-Yuan, Meng-Jung, Yu-Hsuan, & Jyh-Chong, 2017).

Moreover, Lochner, Conrad and Graham's (2015) study found that in order for LMSs to become an integral part of secondary education classrooms, teacher concerns about how they can integrate information and manage the LMS platform needs to be supported. All teachers, regardless of age, would benefit from learning the proper strategies and methods to integrate current technology in their content classroom (Sahin et al., 2016). Hemmings (2015) explained "The mastery of a specific task builds self-efficacy and failure to complete a task brings about a weakening in self-efficacy" (p. 3). Therefore, it can be inferred that the more a teacher becomes a master at using technology in the classroom and utilizing LMSs, the stronger a teacher's efficacy should grow.

Instructional technology coordinators and administrators who plan professional development sessions need to be leaders and have a vision for how technology will be implemented in order to improve student achievement (Yadav, Hong, & Stephenson, 2016). Over time, teachers will become more familiar and comfortable in using the new technology.

However, before teachers are able to implement the technology, the technology should be thoroughly tested for its effectiveness, and school district technology coordinators should understand what motivates a teacher to use technology in their teaching (Sahin, Top, & Delen, 2016).

Professional development opportunities should be robust for teachers to help increase student achievement through implementing technology (Hemmings, 2015). Hardin and Koppenhaver (2016), supported Hemmings study and determined that the goal of implemented professional development is to increase teacher confidence in how they will be able to teach what is learned from professional development. Furthermore, professional development opportunities need to meet the direct context and curricular needs of how teachers will incorporate technology in their subject area (Yadav, Hong, & Stephenson, 2016).

Additionally, how a teacher feels about his or her efficacy in the classroom can be a direct reflection on potential growth as an educator (Lotter, Smiley, Thompson, & Dickenson, 2016). Tilton and Hartnett (2016) explained that in order for teachers to accept new technology, the person using it must believe that they have mastered and comprehend how to use it successfully. The problem is that teachers are not involved in selecting the digital tools that they are required to implement in their classrooms, and teachers have not received the professional development needed to interact successfully with the tools for implementation (Xie et al., 2017). If concerns are not addressed early on, then teachers will not progress with the LMS to the point that they will be unable to implement it with their students (Lochner, Conrad, & Graham, 2015). Therefore, if technology is going to be integrated into teaching practice, then the people who are planning professional development sessions should focus on the training needs of teachers and

how teachers' perceptions of their efficacy can increase through attending these sessions (Power et al., 2016).

In order to grow and improve as an educator, a teacher must be willing to try the latest trends and best practices in education, like technology (Scott & Meeussen, 2017). While it is important for teachers to become experts at implementing best practices in education, it is imperative that administrators offer professional development in those areas in order to increase teacher efficacy (Hardin & Koppenhaver, 2016). In Power, Cristol, Gimbert, Bartoletti, and Kilgore's (2016) study, the researchers found that when teachers take professional development courses about specific strategies, they will gain confidence in their skills and thus increase student engagement. Therefore, if a teacher has a high level of efficacy, then that teacher will be more open to trying new strategies in the classroom using technology. Changes need to be made in how schools train teachers to use technology in their classrooms in order to help students achieve while using technology in order to meet the needs of 21st century education (Scott & Meeussen, 2017). Any remaining barriers that a teacher has in integrating technology should be removed through proper training sessions (Sahin, Top, & Delen, 2016).

Teachers with lower efficacy beliefs are not as open to new teaching methods and practices as teachers with higher efficacy (Nurlu, 2015). If a teacher already has a low sense of efficacy in the classroom, then the teacher may not be open or comfortable using the latest technology with students. As technology advances, it can have a negative effect on teacher efficacy, especially those unwilling to adapt their methods with technology (Hineman, Boury, & Semich, 2015).

Furthermore, Rogers-Haverback and Mee (2015) explained efficacy as a person's belief that they will be successful at completing a task; therefore, if an individual is successful, then

their efficacy strengthens, and when a person fails at a task, then their efficacy weakens, if they started with a low sense of efficacy. Consequently, if teachers use technology in the classroom and the lesson does not work or the technology does not operate as expected, then the teacher's efficacy will decrease, leading teachers to be less likely to use technology in the future. Teacher efficacy prior to implementing technology is important, as noted in the results of Tilton and Harnett's (2016) study , when the researchers determined that if a teacher had high efficacy prior to technology implementation and was not successful implementing it, then the teacher typically maintained their sense of efficacy since their high efficacy belief led them to persevere through the difficulty and attempt to try implementation again in the future.

Tilton and Hartnett's (2016) study participants spent time learning how to use technology in training sessions and on their own time. The participants reported that their efficacy did not decline as a result of exploring technology, but instead they felt their efficacy towards technology improved as a result of the time they spent learning how to use it (Tilton & Hartnett, 2016). Although exploring technology may not change teacher efficacy, mastering technology use will increase teacher efficacy (Hineman et al., 2015). Hineman, et al. (2015) reported, "With schools focusing on technology-based pedagogy, reformers must be reminded that educational improvement efforts will only succeed if teachers possess a high sense of technological self-efficacy" (p. 73). Additionally, teachers must be interested in learning about educational technology if they actually are going to integrate the various applications into their daily lessons (Pierce & Cleary, 2016; 2014). Therefore, training sessions and time spent exploring technology will be beneficial to schools.

Professional development with each kind of technology that the teachers are expected to employ is necessary to improve teacher efficacy using technology, since the variety of

technological applications and systems varies greatly. Yoo's study (2016) determined that professional development sessions which offer specific training sessions based on teachers' needs has a positive effect on teacher efficacy. During professional development, demonstrations of how to utilize the technology effectively will help address specific concerns teachers may have about how to implement it (Lockner et al., 2015). Professional development that includes staff members, administrators, school district directors, and policy makers is needed in order to increase teacher mastery of skills, thus ultimately improving student academic performance (Xie et al., 2017).

Schoology

As methods of communication and technology have developed, a combined environment of face to face instruction and online learning has been created in schools (Ho, Nakamori, Ho, & Lim, 2016). An example of a Learning Management System (LMS) used by K-12 educators, is a platform called Schoology. Millions of people are using Schoology to learn, create, and share academic content (Horn, 2012). School districts create accounts for faculty members, students, and parents to interact, and build courses that offer a digital learning environment for the students to save files, submit assignments, and take assessments whenever and wherever they have access to the Internet (Thomas, 2015). Tech and Learning (2017) described Schoology as an LMS that coordinates resources inside and outside of the classroom and provides an environment with tools for all users to learn, collaborate, and communicate, while providing assessment management instruments, which can be connected to state standards. The results of Ho, Nakamori, Ho, and Lim's (2016) study determined that when schools provide students with online learning communities in their course, such as Schoology, then the course tends to have

more successful learning outcomes than through traditional approaches. The overall goal is for every learner to have a personalized experience which they can access at all times (Horn, 2012).

The way that Schoology is set up mimics Facebook, a popular social networking website used by both children and adults. Therefore, Schoology transitions well into the K-12 school setting (Ridge, 2014). Schoology has a mobile application for students, parents, and teachers to add to their Android, Apple and Kindle Fire devices in order to extend learning and communication outside of school (Ardi, 2017). Crucial in the development of an autonomous learner, Schoology provides students and teachers with a unique social networking experience that encourages reflection, sharing, interaction and overall, supports best practices in pedagogy and cooperative mobile learning (Ardi, 2017). Possibilities for learning opportunities and student engagement are endless as students learn from their peers and teachers, as well as teachers learning from other local faculty and other teachers around the world through the Schoology network (Horn, 2012).

Reasons for Schoology's success in K-12 education include open-access to the course content and instruction throughout the school day, increased student to student and teacher to student interaction, and improved student efficacy in learning. Another benefit for students and teachers who use Schoology is that when students are absent, they can make up anything that they missed because their academic work, resources, and assessments are posted on the site, which has open access even when students are not at school (Haugen, 2015; Ardi, 2017). Alert updates offered on Schoology can be sent to all mobile devices to help parents, students, and teachers keep track of messages, assignments, and grades (Ardi, 2017).

Schoology offers a variety of features to students and teachers in which content is created and delivered by the teacher and where the teacher can distribute and collect assignments, assign

automatically graded assessments, integrate Google Drive applications, and sync the scores on assessments to the class gradebook (Robinson, 2017). The assessment tools offered by Schoology help teachers develop a variety of assessments and assignments (Ardi, 2017). In addition to automated assessments, teachers who use Schoology can make detailed notes of annotation on digital assignments which assists school districts in moving toward a paperless classroom format. The LMS supports self-paced learning through use of the calendar and other classroom management options including keeping track of students' last login, how long students are looking at the course, their posts, and which material they accessed (Ardi, 2017).

Through Schoology, students collaborate with their peers as well as their teachers, which adds a collective decision-making process to their learning experience (Ardi, 2017). The Schoology menu includes Courses, which is developed for each class to interact, Groups, which allows for students and faculty to interact through clubs or activities, and Resources, which allows teachers and students to save and share learning material (Suana et al., 2017). Communication and interaction capabilities are high through the use of Schoology as both students and teachers alike can share media, post updates, comment on posts, 'like' posts, send private messages and share links (Ardi, 2017).

Discussion boards can be set up by the teacher to ensure all students are engaged in their learning (Ardi, 2017). Teachers can assess student engagement as the discussions are live and ongoing, allowing teachers to identify where students' strengths and difficulties are in understanding the content (Ridge, 2014). Additionally, since posts and comments can be seen by all students, this increases peer review of student work (Ardi, 2017). However, there is also an option for the teacher to make smaller discussion groups for students to respond in a more comfortable group environment depending on the need (Thomas, 2015).

Moreover, Schoology has a network for teachers in which they can access professional discussion boards to discuss how they are implementing Schoology in their classrooms (Carpenter, Trust, & Krutka, 2016). Connecting with teachers on forums like discussion boards or blogs provides a support system for educators implementing best practices in education. The professional learning network offered by Schoology includes a variety of interest groups for interaction with educators and experts around the world (Ardi, 2017). There are a variety of networks on the web, and overall the relaxed atmosphere of these networks provide assistance to the needs teachers have in an environment that encourages and supports teachers to innovate in the classroom.

Traditional Instruction

In contrast to technology-infused instruction that utilizes a Learning Management System (LMS), is traditional instruction. Traditional instruction has been the conventional approach to education among school districts, until the 21st century brought the need for additional skills to be taught in K-12 education (Echazzarra, Salinas, Mendez, Denis, & Rech, 2016). With the rise of technology, studies comparing traditional methods to methods that employ technology in the classroom are increasing (Tsai, Tsai, & Hwang, 2016).

Traditional instruction occurs in brick-and-mortar schools which require students to attend a rigid class structure from approximately eight o'clock in the morning until around three o'clock in the afternoon (Toppin & Toppin, 2016). Students are grouped by their ages and are able to progress to the next grade or the next level of content, if they earn at least a D- (Sullivan & Downey, 2015). Traditional instruction is a teacher-directed method in which the teacher disseminates the course content to the students (Mandeville & Stoner, 2015). The course material follows a standard curriculum for the grade level, and the content that the students

receive is distributed to all of the students at the same time (Sullivan & Downey, 2015). The teacher typically gives the students step-by-step instructions as the course proceeds. Students are not actively a part of the learning process but instead rely on the instruction from the teacher to gain knowledge of the content.

When traditional instruction is employed, the students independently learn the content at the same pace as their classmates. Students are passive as they receive the instruction from their teacher in the form of a well-organized, detailed, focused lecture on a specific unit of study (Echazarra et al., 2016). At times, the teacher may ask students questions, which the students are expected to answer. Sometimes teachers accept questions from the students, but the teacher may limit questions, since many student questions can divert the class away from the lesson's objectives. When student questions are answered, it is the only way in a traditional classroom that students' individual needs are met.

The teacher communicates the content throughout the class periods, as students are writing notes in their arranged in rows, separate from their classmates, lending little opportunity for students to discuss the content with others during the class period in this teacher-centered style of learning (Islam & Grönlund, 2016). Traditionally instructed classrooms are taught by teachers who are experts in their content area (Rico & Ertmer, 2015). When the teacher is finished teaching a unit of study then the student explains, by rote memorization, what material was learned during a test (Hugerat, 2015; Rico & Ertmer, 2015). Traditional teachers typically believe that memorization and repetition are strategies that best help students gain the meaning of basic concepts (Echazarra et al., 2016). Students' assignment submissions reflect the teacher-taught material and the teacher is the only person who interacts with the students' work (Lee & Hannafin, 2016).

The typical resource in a traditionally instructed classroom is a textbook, and students study by memorizing facts for assessments from the teacher's lectures, independent reading, and students' notes from the class periods (Aidinopoulou & Sampson, 2017; Mehta & Fine, 2015). In this type of setting, the students are not actively learning, but instead the students are reading and listening. Overall, the action of deep thought and personal application is missing from the traditional lesson. When students answer questions in a traditional classroom, there is typically only one correct answer, and students do not want to make mistakes because the traditional environment is rigid (Keengwe, 2015).

Through the use of these typical resources, teachers disseminate the content from the same curricula to all students in the classroom (Staker & Horn, 2012). Information that is provided to the students is predetermined by a set curriculum, which allows for little change in content from the teacher (Keengwe, 2015). Although there is a curriculum, the teacher ultimately gets to decide how the content will be delivered and sets objectives for the class as a whole, regardless of the students' interest or ability (Echazarra et al., 2016). Content is predetermined, and the teacher's role is to help students master that content and concurrent required skills (Mehta & Fine, 2015). Lessons for the course are preplanned and can be used year after year because they meet the goals of the curriculum. Personalized learning is not present in the traditional instructed classroom.

Training provided for teachers in a traditionally instructed school is held during in-service days. The content of professional development sessions for teachers in traditional education is presented to the faculty as a whole group based on the faculty's needs or the school district's needs (Richardson, Beck, LaFrance, & McLeod, 2016). Rarely do teachers have a

choice in their professional development sessions, as the sessions are predetermined either by departments, grades, or school buildings.

Summary

Research studies on the effects of using a Learning Management System in K-12 education are limited. Furthermore, the studies conducted on teacher efficacy using an LMS in the K-12 environment are even rarer. Literature that exists about LMSs in K-12 education includes Scott & Meeussen's (2017) research, which describes how third grade teachers enhanced their classroom through LMS learning. Additionally, Rahgozaran and Gholami's (2014) study found a relationship between student achievement and teacher efficacy. Lastly, the benefits of an LMS on creating personalized learning opportunities to support student achievement were explained in Tilton and Hartnett's (2016) study.

Further research was needed to determine if teachers have stronger efficacy beliefs while using an LMS in the classroom or if teachers' efficacy beliefs are stronger in a traditionally instructed classroom. With many schools incorporating LMSs in their classrooms, it is extremely important to study the effects on teacher efficacy. Heath's (2017) study concluded "if technology is to support meaningful pedagogical change in classrooms, teachers need to be given time, support, and trust to build positive beliefs about technology and a strong professional identity" (p. 103). Additionally, how a teacher adopts and implements instructional technology is dependent upon how efficaciously they are able to do it (Power et al., 2016). Implications from a study on teacher efficacy while using an LMS in K-12 education in comparison to traditional education will aid instructional technology managers in selecting the best technology to increase teacher sense of efficacy, thus improving student achievement and also providing teachers with appropriate professional development to support the technology.

CHAPTER THREE: METHODS

Overview

This quantitative study compared the sense of efficacy of teachers who employ traditional instructional methods and teachers who use the Learning Management System (LMS), Schoology, across the following specific domains: overall teacher sense of efficacy, efficacy in student engagement, efficacy in instructional strategies, and efficacy in classroom management. The researcher conducted the causal comparative study with five school districts across three counties in eastern Pennsylvania, using the Teacher Sense of Efficacy Scale (TSES). After data collection, the researcher utilized SPSS software to run the multivariate analysis of variance (MANOVA) to analyze the dependent variables in the study. This test determined differing senses of efficacy between   teachers who use traditional instructional methods and teachers who use Schoology.

Design

In this causal comparative study, the researcher compared traditional teachers and teachers who use Schoology to investigate if there was a difference in high school teacher efficacy of those teachers, as measured by the TSES. The first area of comparison was overall teacher sense of efficacy. Three other areas of comparison included teacher sense of efficacy in: student engagement, instructional strategies, and classroom management among the two categories of traditional teachers and teachers who use Schoology. A causal comparative research design was appropriate for this study because the independent variable is present in one category of teachers and absent in the other category, and the study determined how the categories of teachers differ in their reported sense of efficacy (Gall, Gall, & Borg, 2007). This study determined if there was a difference in high school teacher's sense of efficacy among the

two groups, traditional teachers and teachers who use Schoology with their students. Technology administrators determine whether schools have learning management systems or not; therefore, the two groups of teachers were already existing prior to the research study.

Research Question

This study is designed to answer the following research question (RQ):

RQ1. Is there a statistically significant difference in high school teachers' sense of efficacy (e.g. student engagement, instructional strategies, and classroom management), as measured by the Teacher Sense of Efficacy Scale (TSES) based on traditional instruction or teaching with the Learning Management System (LMS), Schoology?

Hypotheses

The null hypotheses for this study are:

$H_0 1$: There will be no statistically significant difference in high school teachers' sense of efficacy *overall*, as measured by the Teacher Sense of Efficacy Scale (TSES), based on traditional instruction or teaching with the LMS, Schoology.

$H_0 2$: There will be no statistically significant difference in high school teachers' sense of efficacy: *student engagement*, as measured by the Teacher Sense Efficacy Scale (TSES), based on traditional instruction or teaching with the LMS, Schoology.

$H_0 3$: There will be no statistically significant difference in high school teachers' sense of efficacy: *instructional strategies*, as measured by the Teacher Sense of Efficacy Scale (TSES), based on traditional instruction or teaching with the LMS, Schoology.

$H_0 4$: There will be no statistically significant difference in high school teachers' sense of efficacy: *classroom management*, as measured by the Teacher Sense of Efficacy Scale (TSES), based on traditional instruction or teaching with the LMS, Schoology.

Participants and Setting

The participants in this study included high school teachers from three counties in eastern Pennsylvania during the 2018-2019 school year. The counties included ███████ County, ███████ County, and ██████ County. The researcher employed a convenience sample in this study because the researcher lives in eastern Pennsylvania. The superintendents of the five public school districts: ████████ School District, █████████ School District, ████████ Area School District, ████████ School District, and ███████ Area School District gave email authorization to the researcher to collect data from the high school teachers.

████████ School District is located in █████ County. █████ County comprises a population of 63,853 across 381 square miles. The demographics of the █████ County's population includes 91.9% White, 4.7% Hispanic or Latino, 2.1% Black or African America, 0.6% Asian, 1.1% Two or More Races, 0.3% American Indian and Alaska Native, and 0.1% Native Hawaiian and Other Pacific Islander (U.S. Census, 2017). According to the U.S. Census (2017), 13.1% of the population are in poverty and the median household income is $50,822.

█████████ School District resides in ██████ County, which spans 608 square miles and includes a population of 168,046 people. In ██████ County, the demographics encompass 66.2% White, 15.9% Hispanic or Latino, 15.8% Black or African American, 2.5% Asian, 2.7% Two or More Races, 0.6% American Indian and Alaska Native, and 0.1% Native Hawaiian and Other Pacific Islander (U.S. Census, 2017). ██████ County's population has 12% in poverty and the county's median household income is $58,980.

████████ Area School District, █████████ School District, and ████████ School District are located in ████████ County, which covers 369 square miles, and 303,405 people populate the area. The U.S. Census (2017) reported the demographics of the county

population as 76.8% White, 13.2% Hispanic or Latino, 6.7% Black or African American, 3% Asian, 2.2% Two or More Races, 0.4% American Indian and Alaska Native, and 0.1% Native Hawaiian and Other Pacific Islander. Of the county population, 9.3% are in poverty and the median household income is $62,753 (U.S. Census, 2017).

The researcher employed a convenience sample since participation was needed from specific grade level teachers. Every high school teacher was offered the opportunity to participate in the study during the fall semester of the 2018-2019 school year. The participants were divided into Group 1 (teachers who use Schoology) and Group 2 (traditional teachers). These two groups were compared throughout the study against the dependent variables.

The teachers who voluntarily participated from grades nine through twelve teach a variety of subjects. Demographic and other information about their current teaching positions from the participants include their age, ethnicity, gender, courses taught, and years of teaching experience. Demographic data was collected digitally in conjunction with the survey that preceded the Teacher Sense of Efficacy Scale (TSES). The researcher typed the consent form, demographic questions, and TSES questions into SurveyMonkey for the participants to complete. Tschannen-Moran and Hoy (2001) consented to use the survey in this study.

The high school teachers had the opportunity to voluntarily participate after each superintendent gave consent. With the superintendents' consent, the researcher emailed an electronic link from SurveyMonkey to the high school teachers through the school districts' email during the Fall Semester of the 2018-2019 school year. The link included a consent form to participate in the study, demographic survey questions, and the TSES survey.

The researcher collected the survey responses from the high school teachers. In the study, 507 surveys were distributed via email. Participants were identified as belonging to one of two

possible subgroups: traditional teachers or teachers who use Schoology. The researcher employed survey research in this study because the TSES is a 9-point Likert-type survey. The number of participants sampled for an adequate sample size was a minimum of 50 teachers for survey research, because according to Gall, Gall, and Borg (2007) "a minimum of 100 participants in each major subgroup and 20 to 50 in each minor subgroup" is needed (p. 176).

Descriptive information about the high school teacher participants is included in Table 1 below. Group 1 includes the Schoology teachers' demographic responses. There were 34 females and 16 males of the total random sample of Schoology teachers who voluntarily completed the survey. Of the Schoology teacher responses, 4 teachers were 20 to 29 years old, 19 teachers were 30-39 years old, 15 teachers were 40-49 years old, 9 teachers were 50-59 years old, and 3 teachers were 60-69 years old. Ethnic backgrounds of the Schoology teachers include 49 who were Caucasian and 1 Hispanic teacher. As far as courses taught, 6 teach mathematics, 10 teach English, 8 teach social studies, 8 teach science, 1 teaches physical education, 3 teach art, and 9 teach other subjects. The teaching experience of the Schoology teacher participants include 9 teachers who have been teaching 0-9 years, 22 teachers teaching 10-19 years, 17 teachers teaching 20-29 years, and 2 teachers who have been teaching 30-39 years.

In Table 1, Group 2 includes the demographic responses from the traditional teachers. Of the 50 traditional teachers, who completed the survey, there were 39 female and 11 male teachers. Age ranges of the 50 traditional teachers' responses include, 5 who are 20 to 29 years old, 16 who are 30-39 years old, 15 who are 40-49 years old, 9 who are 50-59 years old, and 5 who are 60-69 years old. Ethnic backgrounds of the traditional teachers include 49 who are Caucasian, 1 who is Hispanic. Courses taught by participants include 11 who teach mathematics, 5 who teach English, 8 who teach social studies, 14 who teach science, 3 who teach

physical education, 2 who teach art, and 6 who teach other subjects. The teaching experience of

the traditional teachers include 7 who have been teaching 0-9 years, 27 teachers who have been

teaching 10-19 years, 11 teachers who have been teaching 20-29 years, and 5 who have been

teaching between 30-39 years.

Table 1

Demographic Statistics for Schoology Teachers and Traditional Teachers

Demographic Statistics		
	Schoology	Traditional
Females	34	39
Males	16	11
20-29 years old	4	5
30-39 years old	19	16
40-49 years old	15	15
50-59 years old	9	9
60-69 years old	3	5
Caucasian	49	49
Hispanic	1	1
Art	3	2
English	10	5
Mathematics	6	11
Other	9	6
Physical Education	1	3
Science	8	14
Social Studies	8	8
World Language	5	1
0-9 years teaching	9	7
10-19 years teaching	22	27
20-29 years teaching	17	11
30-39+ years teaching	2	5

Instrumentation

The instrument that was used in this study is the long-form of the Teacher Sense of

Efficacy Scale (TSES). The survey was created to help researchers gain a better understanding

of the factors that teachers consider important to good teaching as well as to understand the

factors that make teaching difficult in schools (Tschannen-Moran & Hoy, 2001). The researcher

attained permission to employ Tschannen-Moran and Hoy's (2001) TSES in this study.

Tschannen-Moran and Hoy created a 12-item short form of the TSES, as well as a 24-tem long-form.

The researcher decided to use the 24-item long-form of the TSES to give strength to the teachers' responses. In the 24-item long-form of the TSES, there are three factors that are included in the scale to help determine teacher beliefs: Efficacy in Student Engagement, Efficacy in Instructional Strategies, and Efficacy in Classroom Management. Eight questions from each factor are included in the TSES to create the 24-item scale. The three factors of teacher sense of efficacy are evidenced by specific questions on the TSES. Questions 1, 2, 4, 6, 9, 12, 14, and 22 are about teacher sense of efficacy student engagement. Questions 7, 10, 11, 17, 18, 20, 23, and 24 are about teacher sense of efficacy instructional strategies. Questions 3, 5, 8, 13, 15, 16, 19, and 21 are about teacher sense of efficacy classroom management.

The long-form TSES employs a nine-point Likert-type scale that answers the question 'How much can you do?' with a range of responses from 'Nothing' to 'A Great Deal'. Responses include: 'Nothing' = 1, in between 'Nothing' and 'Very Little' = 2, 'Very Little' = 3, in between 'Very Little' and 'Some Influence' = 4, 'Some Influence' = 5, in between 'Some Influence' and 'Quite a Bit' = 6, 'Quite a Bit' = 7, in between 'Quite a Bit' and 'A Great Deal' = 8, and 'A Great Deal' = 9. The survey's highest possible score is 216, which means a teacher strongly believes he/she is greatly efficacious in his/her classroom. The survey's lowest possible score is 24, meaning that a teacher strongly does not believe he/she is effective in the classroom. Therefore, the higher a teacher's response score on the TSES, then the stronger a teachers' sense of efficacy.

Positive correlations with other measures of teacher efficacy provide evidence of reliability. Table 2 below indicates that there are high alpha scores in the following categories: overall teacher efficacy (.94), Efficacy in Student Engagement (.87), Efficacy in Instruction (.91), and Efficacy in Classroom Management (.90); respectfully. High alpha scores mean that the scale is reliable, since reliability coefficients above .70 show acceptable reliability (Gall et al., 2007).

Multiple studies have been conducted to examine the validity and reliability of the instrument. The factor structure of the TSES of the four categories of efficacy (efficacy overall, efficacy in student engagement, efficacy in instruction, and efficacy in classroom management) was assessed in the study by Duffin, French, and Patrick (2011), and their study showed strong validity for the instrument. Validity and reliability were also studied through the research by Ruan et al. (2015) as the researchers sought to determine and later confirmed that the TSES was a good fit for producing results to cross-cultural studies. Additionally, Fives and Buehl (2009) examined the TSES to determine differences between the long and short forms of the instrument among preservice and in-service teachers. Fives and Buehl (2009) determined that the short, 12-item form was sufficient for preservice teachers, but the long form was necessary for gaining results from in-service teachers.

Table 2

Mean, Standard Deviation, and Alpha Scores for the TSES

In Tschannen-Moran, M., & Woolfolk Hoy, A. (2001). Teacher efficacy: Capturing and elusive construct. *Teaching and Teacher Education, 17,* 783-805, the following were found:

	Long Form			Short Form		
	Mean	SD	alpha	Mean	SD	alpha
OSTES	7.1	.94	.94	7.1	.98	.90
Engagement	7.3	1.1	.87	7.2	1.2	.81
Instruction	7.3	1.1	.91	7.3	1.2	.86
Management	6.7	1.1	.90	6.7	1.2	.86

Several studies have used the TSES in their research to determine teacher efficacy. Researchers have used the TSES to compare groups of teachers, to help learn about pre-service teachers, and compare leadership abilities with the teachers' sense of efficacy. In Cheung's (2008) study, the researcher compared teacher efficacy between primary level teachers from two different cities to determine the factors that impact teacher efficacy between the cities' schools. Stewart (2012) employed the TSES to determine how pre-service teachers' teacher efficacy would change as a result of participating in service-learning training. In Mehdinezhad and Mansouri's (2016) study, the researchers investigated how principals' leadership behaviors influence teachers' sense of efficacy. The results of these studies successfully used the TSES, and their studies contributed to the greater body of literature on teacher efficacy because the studies led to discussions on how to improve teacher sense of efficacy through many different relationships and factors.

Procedures

To begin conducting survey research, the researcher needed approval from the IRB. After IRB approval, the researcher sought permission from the superintendents of the school districts to elicit participants for the study using the school district's email system. The researcher typed the TSES questions in the online survey site, SurveyMonkey and utilized the site because responses can be organized and calculated with ease, and the link to the survey can be distributed via email. Upon receiving permission from the superintendents, the researcher began distributing the survey questions via email in late August. The researcher emailed the link to all high school teachers in the county school districts. The due date for the survey to be voluntarily completed was four weeks from the initial survey distribution date. When two weeks

passed from the initial survey distribution date, the researcher sent a reminder email to all high school teachers to prompt possible participants to answer the survey.

Before beginning the TSES, the teachers electronically consented to participate in the study. Then, participants had the option to give their personal email address to have the opportunity to be randomly selected for a $10 Dunkin Donuts gift card, which was distributed to three participants per school in thanks for participating in the study. Next, participants answered demographic and other questions about their teaching positions for the purpose of understanding the participants. These questions answered information about the participants' age, ethnicity, gender, grade level taught, courses taught, and years of teaching experience. Lastly, the participants began the TSES.

To prepare the data for analysis in SPSS, the data for Group 1 and Group 2 was organized in Microsoft Excel. Multivariate analysis of variance (MANOVA) was run using SPSS Software in order to compare the means of the two groups, of which a random sample of 50 participants from each group was taken from the survey responses (Gall et al., 2007). The random sample was determined by using the random number generator from the website, random.org.

Data Analysis

The researcher analyzed the data using MANOVA to test if each dependent variable differs significantly because in this study the data has two groups, and this analysis can determine if there is a significant difference on several different variables (Warner, 2013). Because there are four dependent variables, as represented in the four null hypotheses, a MANOVA included all of the null hypotheses at the same time. With the exception of the overall teacher sense of efficacy null hypothesis, the other three null hypotheses have specific

questions that were analyzed to determine teachers' sense of efficacy in student engagement,

instructional strategies, and classroom management.

Prior to running the MANOVA, data screened to determine errors, inconsistencies, or

outliers for each hypothesis. Data screening occurred using a box and whisker plot. Five

outliers were found during data screening. The Kolmogorov-Smirnov test checked for violations

of normality. In the Kolmogorov-Smirnov test, a significant value greater than .05 means that

the data is normal (Warner, 2013). Histograms for each group and dependent variable

determined normal distribution.

CHAPTER FOUR: FINDINGS

Overview

A one-way multivariate analysis of variance (MANOVA) analyzed the data between the two groups, traditional teachers and teachers who use Schoology. This chapter includes the descriptive statistics, assumption tests, and MANOVA analysis for each hypothesis. After analyzing the data, the results supported the null hypotheses of no statistically significant difference in reported teacher sense of efficacy, in the two groups traditional teachers and teachers who use Schoology.

Research Question

RQ1: Is there a statistically significant difference in high school teachers' sense of efficacy (e.g. student engagement, instructional strategies, and classroom management), as measured by the Teacher Sense of Efficacy Scale (TSES) based on traditional instruction or teaching with the Learning Management System (LMS), Schoology?

Null Hypotheses

$H_0 1$: There will be no statistically significant difference in high school teachers' sense of efficacy *overall*, as measured by the Teacher Sense of Efficacy Scale (TSES), based on traditional instruction or teaching with the LMS, Schoology.

$H_0 2$: There will be no statistically significant difference in high school teachers' sense of efficacy: *student engagement*, as measured by the Teacher Sense Efficacy Scale (TSES), based on traditional instruction or teaching with the LMS, Schoology.

$H_0 3$: There will be no statistically significant difference in high school teachers' sense of efficacy: *instructional strategies*, as measured by the Teacher Sense of Efficacy Scale (TSES), based on traditional instruction or teaching with the LMS, Schoology.

H$_0$4: There will be no statistically significant difference in high school teachers' sense of efficacy: *classroom management*, as measured by the Teacher Sense of Efficacy Scale (TSES), based on traditional instruction or teaching with the LMS, Schoology.

Descriptive Statistics

Data collection occurred through the use of the Teacher Sense of Efficacy Scale (TSES), where the four dependent variables of teacher sense of efficacy in student engagement, instructional strategies, classroom environment, and teacher sense of efficacy overall encompass the total scale score (Tschannen-Moran & Hoy, 2001). Teacher data collection occurred with high schools from traditional teachers and teachers who utilize the Learning Management System (LMS), Schoology with their students. The mean and standard deviation scores for traditional teachers include: teacher sense of efficacy overall (*M*= 173.18, *SD*= 21.50), student engagement (*M*= 53.74, *SD*= 9.33), instructional strategies (*M*= 59.82, *SD*= 59.82), and classroom management (*M*= 59.62, *SD*= 8.48). Teachers who used Schoology reported mean and standard deviation scores for the variables as teacher sense of efficacy overall (*M*= 171.90, *SD*= 17.55), student engagement (*M*= 53.12, *SD*= 8.08), instructional strategies (*M*= 58.74, *SD*= 6.92), and classroom management (*M*= 60.04, *SD*= 6.88) (see Table 3).

Results

Data Screening

The researcher screened the data for the dependent variables (teacher sense of efficacy overall, student engagement, instructional strategies, and classroom environment) in each group regarding data inconsistencies, outliers, and normality. There were no inconsistencies identified. To locate outliers among the dependent variables (see Figure 1 for box and whisker plot), the researcher utilized box and whisker plots. After analyzing the figures, the researcher located

outliers from five of the participants. There were five outliers and zero extreme outliers. The

researcher decided to include the five outliers because the results of the MANOVA including the

outliers and the MANOVA excluding the outliers were not statistically significant.

Table 3

Descriptive Statistics for Teacher Sense of Efficacy Overall, Student Engagement, Instructional Strategies, and Classroom Environment Scores

Descriptive Statistics				
	Teaching Method	Mean	Std. Deviation	N
Student Engagement	Schoology	53.1200	8.08031	50
	Traditional	53.7400	9.33024	50
	Total	53.4300	8.68908	100
Instructional Strategies	Schoology	58.7400	6.92470	50
	Traditional	59.8200	6.44819	50
	Total	59.2800	6.67890	100
Classroom Management	Schoology	60.0400	6.87783	50
	Traditional	59.6200	8.48021	50
	Total	59.8300	7.68450	100
Teacher Efficacy Overall	Schoology	171.9000	17.54906	50
	Traditional	173.1800	21.49769	50
	Total	172.5400	19.53418	100

Assumptions

A one-way multivariate analysis of variance (MANOVA) was conducted to determine

the effect of traditional teaching and teaching with Schoology on teacher sense of efficacy

overall, student engagement, instructional strategies, and classroom management. The

MANOVA test required a variety of assumptions including normality, multivariate normal

distribution of dependent variables, a linear relationship between the dependent variables,

homogeneity of variance-covariance, and no multicollinearity. The researcher conducted the

Kolmogorov-Smirnov test to determine normality since the sample size was greater than 50

(N=100). After running the Kolmogorov-Smirnov test, it determined that the assumption of

normality was met for each group because the significance was more than 0.05 for the two

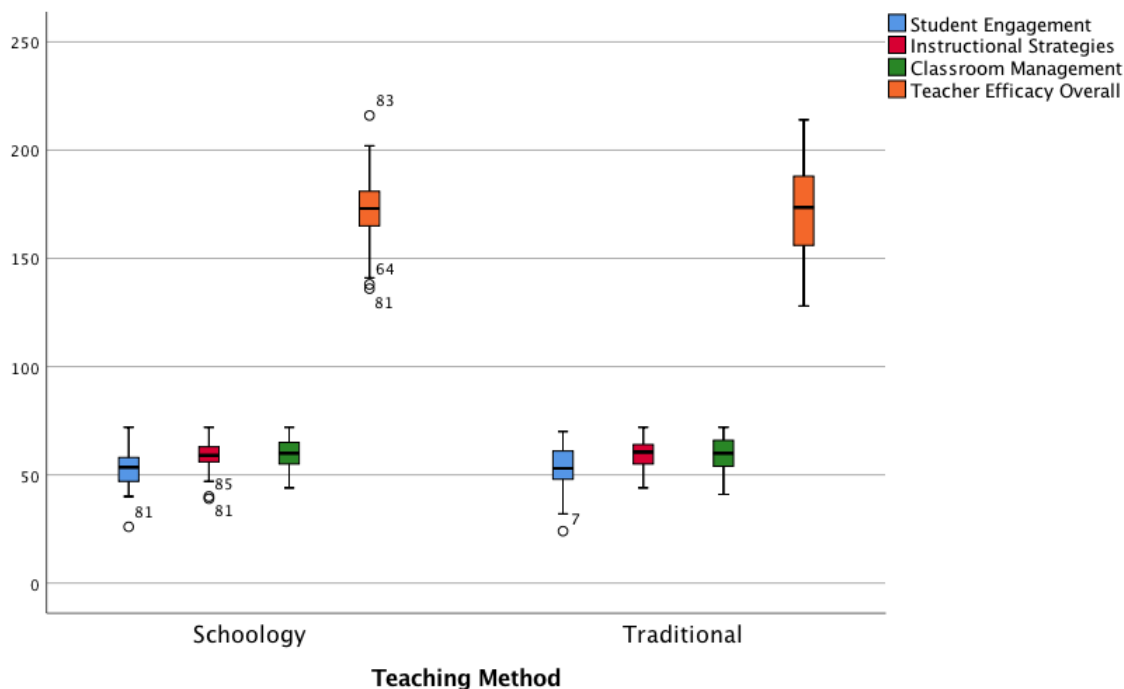groups, traditional teachers and teachers who use Schoology (see Table 4).

Figure 1. Box and Whisker Plot of Teacher Sense of Efficacy Overall, Student Engagement, Instructional Strategies, and Classroom Management Scores

Table 4

Test of Normality for Teacher Sense of Efficacy Overall, Student Engagement, Instructional Strategies, and Classroom Management Scores

	Teaching Method	Kolmogorov-Smirnov[a]		
		Statistic	df	Sig.
Student Engagement	Schoology	.073	50	.200[*]
	Traditional	.088	50	.200[*]
Instructional Strategies	Schoology	.115	50	.096
	Traditional	.083	50	.200[*]
Classroom Management	Schoology	.107	50	.200[*]
	Traditional	.117	50	.084
Teacher Efficacy Overall	Schoology	.108	50	.198
	Traditional	.085	50	.200[*]

Notes. *. This is a lower bound of the true significance.
a. Lilliefors Significance Correction

To identify normality among each group, the researcher used histograms (see Figures 2, 3, 4, 5, 6, 7, 8, and 9).
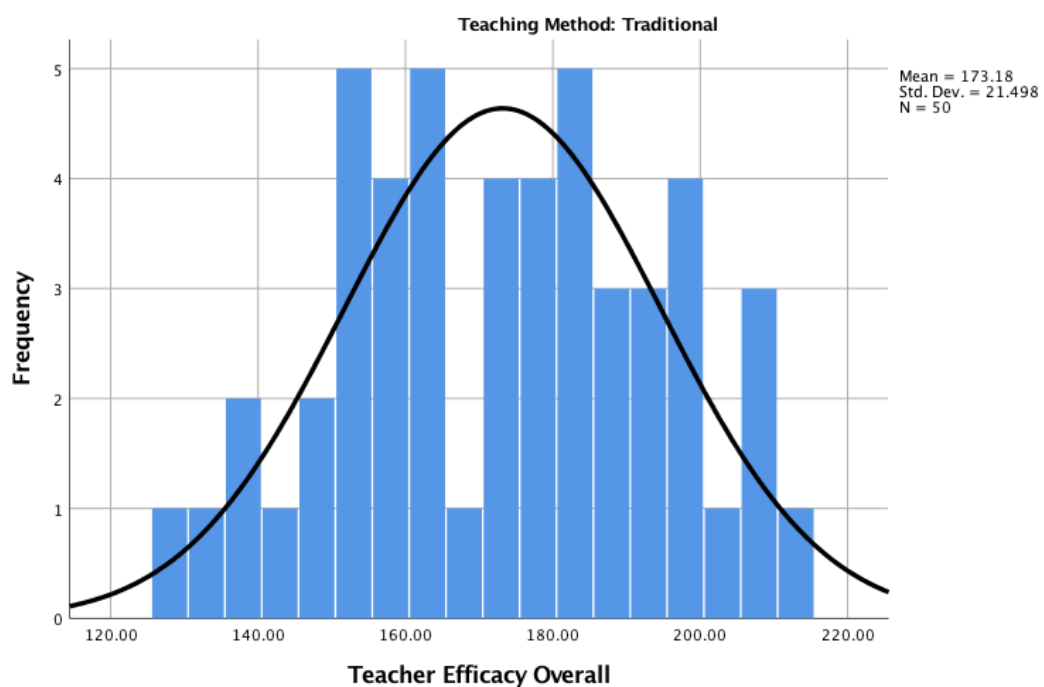

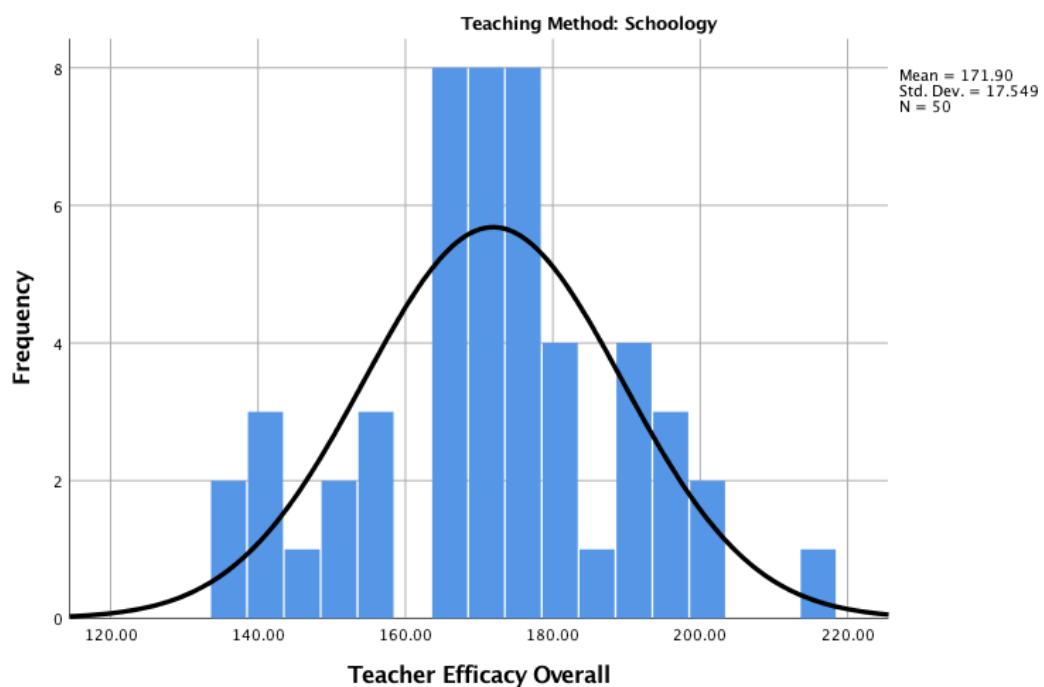*Figure 2.* Histogram of Teacher Sense of Efficacy Overall for Traditional Teachers.

Figure 3. Histogram of Teacher Sense of Efficacy Overall for Teachers who Use Schoology.
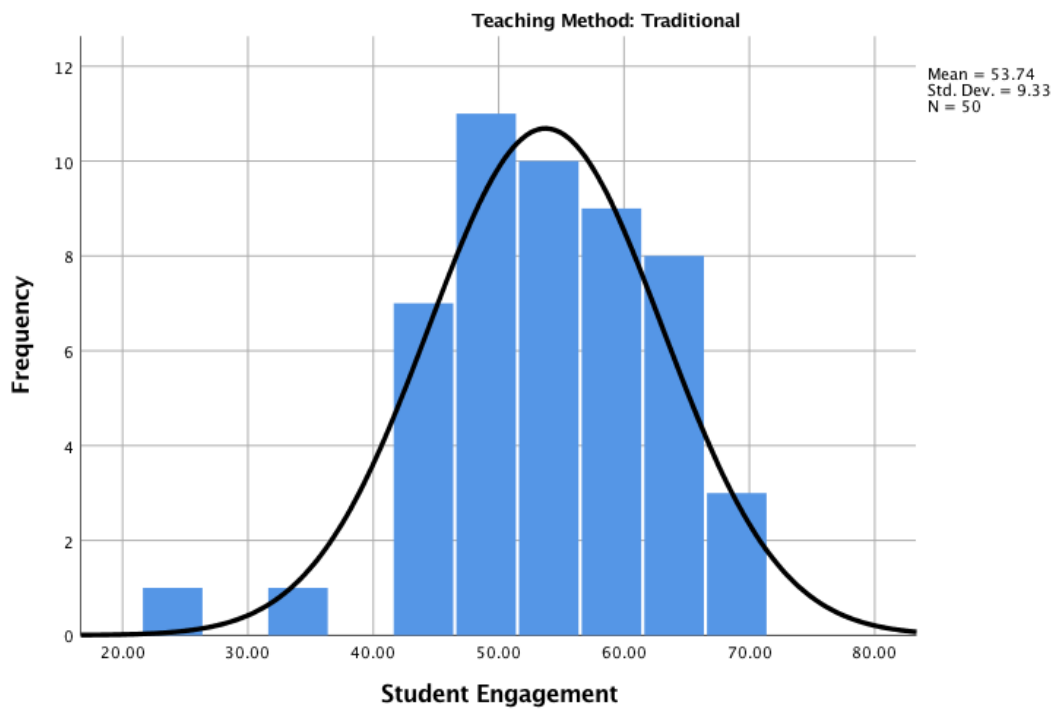
Figure 4. Histogram of Teacher Sense of Efficacy Student Engagement for Traditional Teachers.
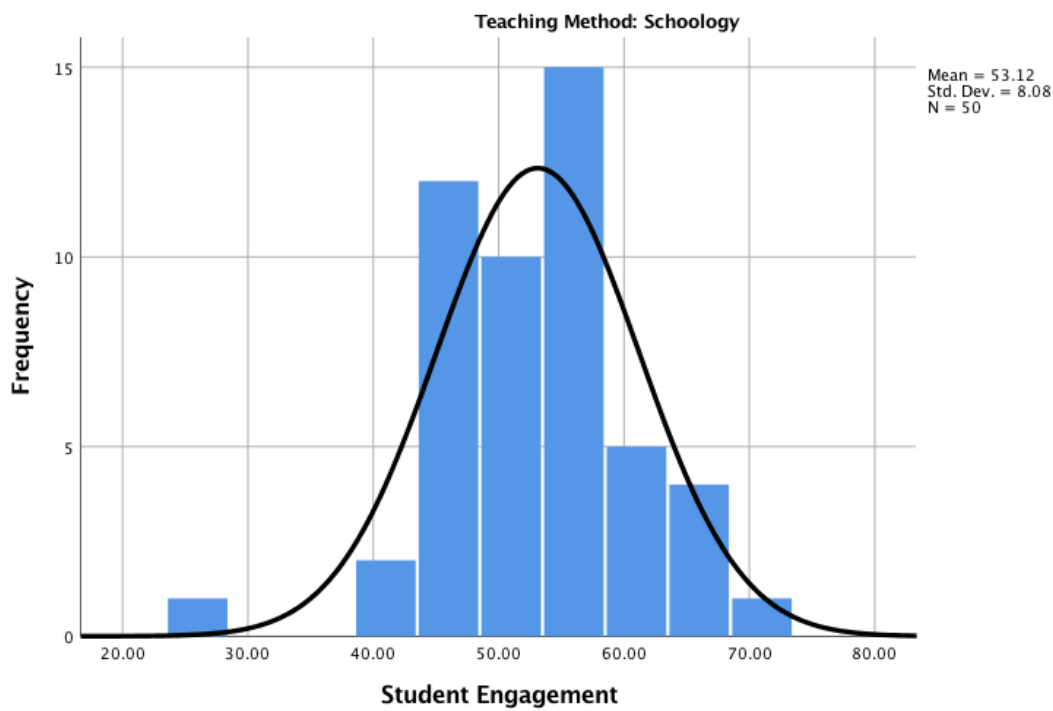

Figure 5. Histogram of Teacher Sense of Efficacy Student Engagement for Teachers who Use Schoology
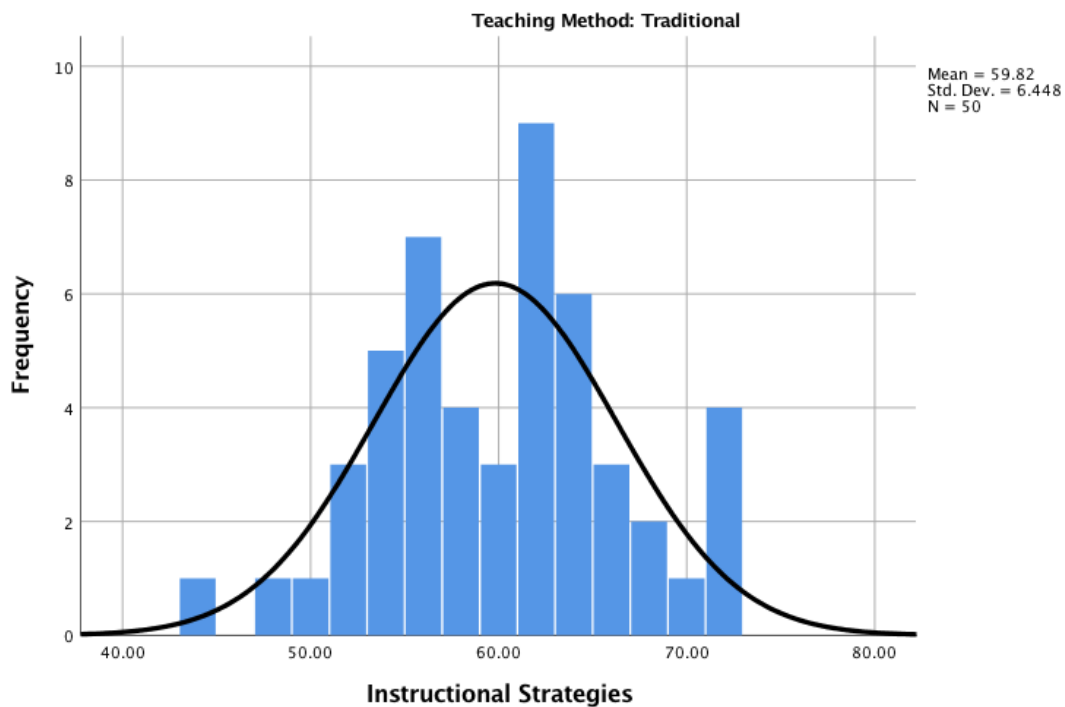
Figure 6. Histogram of Teacher Sense of Efficacy Instructional Strategies for Traditional Teachers.
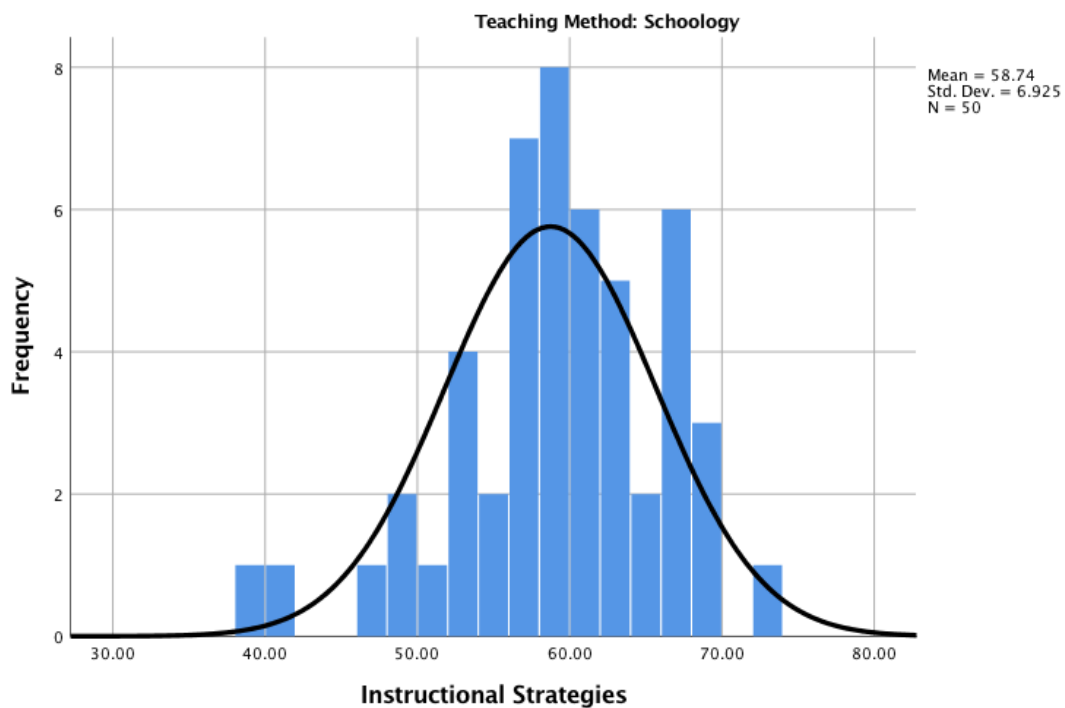

Figure 7. Histogram of Teacher Sense of Efficacy Instructional Strategies for Teachers who Use Schoology.
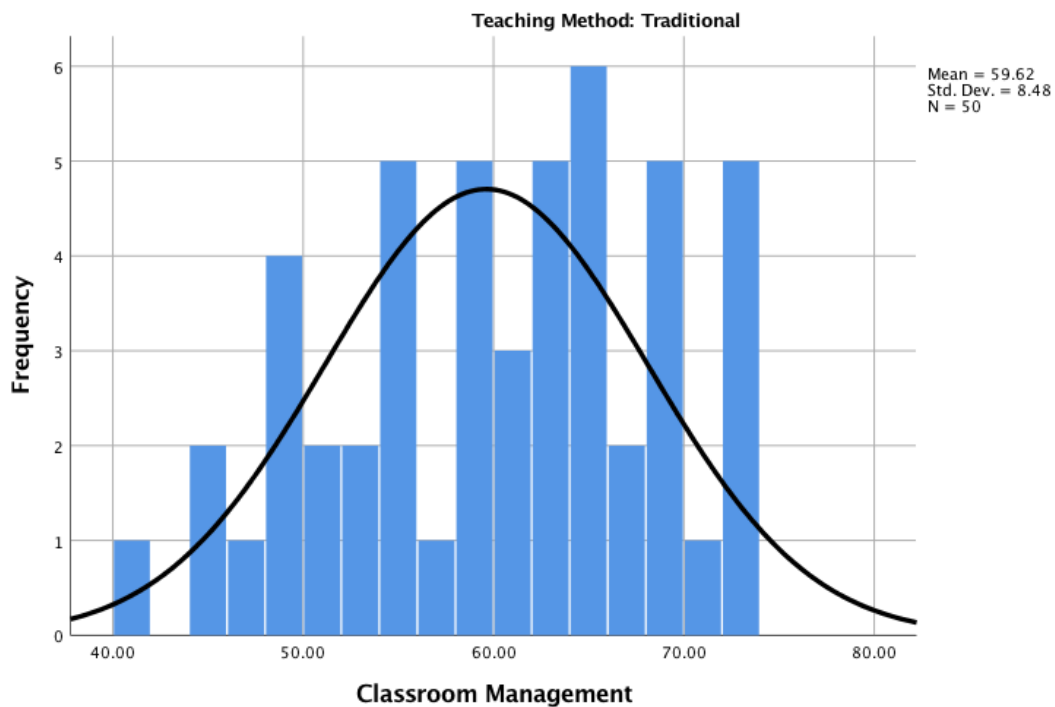
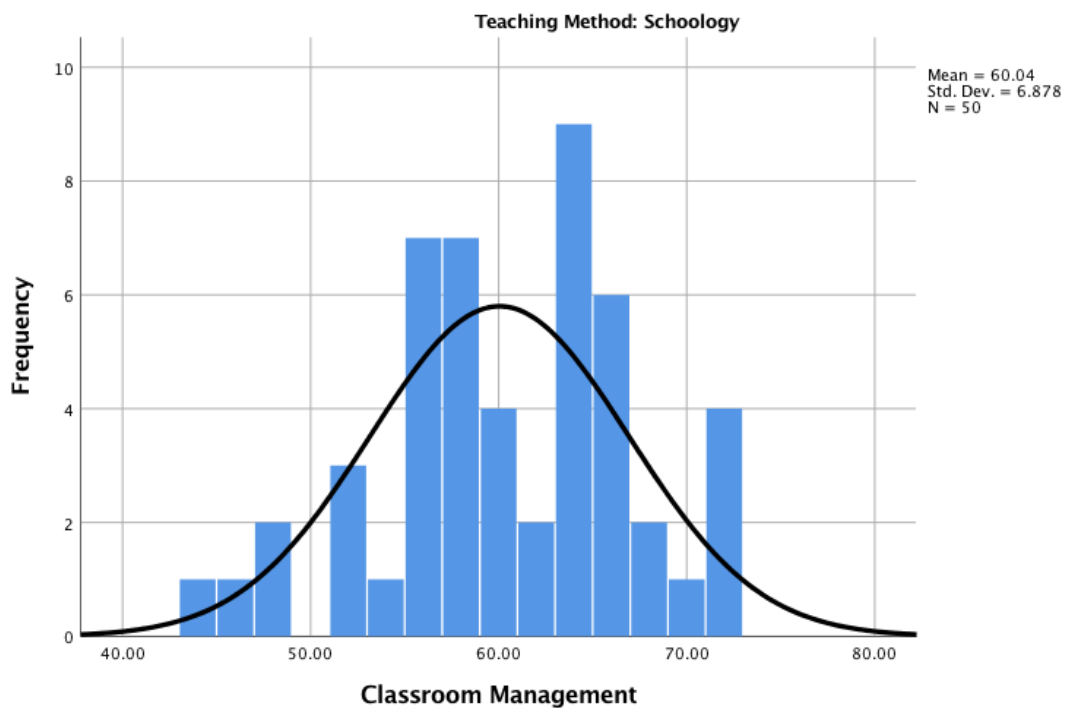*Figure 8.* Histogram of Teacher Sense of Efficacy Classroom Management for Traditional Teachers.

Figure 9. Histogram of Teacher Sense of Efficacy Classroom Management for Teachers who Use Schoology.

In order to determine if there was a linear relationship between the dependent variables for each independent variable, the researcher reviewed the scatterplot matrices (see Figure 10). The scatterplots produced the cigar-shape distribution, therefore, confirming the variables are linearly related.

Figure 10. Scatterplot Distribution of Teacher Sense of Efficacy Overall, Student Engagement, Instructional Strategies, and Classroom Management.

To determine if there was homogeneity of variance-covariance matrices, the researcher conducted the Box's M test of equality of covariance of student engagement, instructional strategies, and classroom management scores. The teacher efficacy score overall was omitted because it is the culminating score of the three variables. The results of the Box's M test were not significant ($p = .001$); therefore, the assumption of homogeneity of variance-covariance matrices was met (see Table 5).

Table 5

Box's Test of Equality of Covariance for Teacher Sense of Efficacy: Student Engagement, Instructional Strategies, and Classroom Management Scores

Box's M	24.589
F	3.962
df1	6
df2	69583.698
Sig.	.001

Note. Tests the null hypothesis that the observed covariance matrices of the dependent variables are equal across groups.[a]

 a. Design: Intercept + teach_mthd

The last assumption test was to determine if there was no multicollinearity. The researcher

reviewed the Pearson's Product Moment test to look at correlations (see Table 6).

Table 6

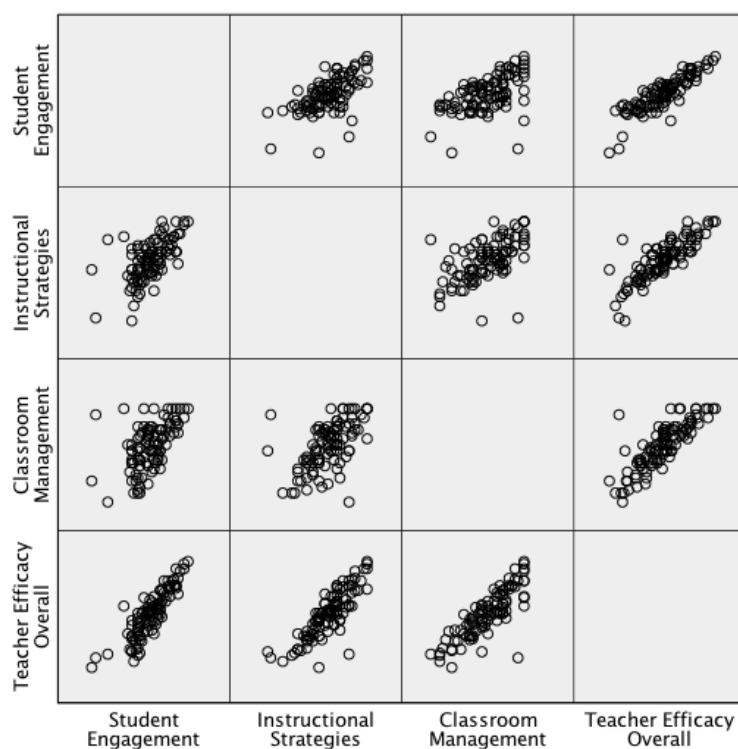*Pearson's Product Correlations for Teacher Sense of Efficacy, Overall, Student Engagement, Instructional Strategies, and Classroom Management*

		Student Engagement Score	Instructional Strategies	Classroom Management	Teacher Efficacy Overall Score
Student Engagement Score	Pearson Correlation	1	.609**	.548**	.869**
	Sig. (2-tailed)		.000	.000	.000
	N	100	100	100	100
Instructional Strategies	Pearson Correlation	.609**	1	.570**	.837**
	Sig. (2-tailed)	.000		.000	.000
	N	100	100	100	100
Classroom Management	Pearson Correlation	.548**	.570**	1	.832**
	Sig. (2-tailed)	.000	.000		.000
	N	100	100	100	100
Teacher Efficacy Overall Score	Pearson Correlation	.869**	.837**	.832**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	100	100	100	100

**. Correlation is significant at the 0.01 level (2-tailed).

Results for Null Hypotheses One through Four

To test the null hypotheses, the researcher used a one-way multivariate analysis of variance (MANOVA) to determine the if there was a difference between the two groups' traditional instruction or teaching with the Learning Management System, Schoology, on any of the variables scores for high school teacher sense of efficacy overall, student engagement, instructional strategies, and classroom management. Scores measured by the Teacher Sense of Efficacy Scale (Tschannen-Moran & Hoy, 2001). The results of the MANOVA determined there was not a statistically significant difference at a 95% confidence level since the Wilk's Λ = .985; $F(3, 96)$ = .481; p = 0.696; η^2 = 0.015 (see Table 7). Since the results of the MANOVA were not statistically significant, no post hoc analysis was needed.

Table 7

Multivariate Tests for Teacher Sense of Efficacy, Overall, Student Engagement, Instructional Strategies, and Classroom Management

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
Intercept	Pillai's Trace	.989	2907.915[b]	3.000	96.000	.000	.989
	Wilks' Lambda	.011	2907.915[b]	3.000	96.000	.000	.989
	Hotelling's Trace	90.872	2907.915[b]	3.000	96.000	.000	.989
	Roy's Largest Root	90.872	2907.915[b]	3.000	96.000	.000	.989
teach_mthd	Pillai's Trace	.015	.481[b]	3.000	96.000	.696	.015
	Wilks' Lambda	.985	.481[b]	3.000	96.000	.696	.015
	Hotelling's Trace	.015	.481[b]	3.000	96.000	.696	.015
	Roy's Largest Root	.015	.481[b]	3.000	96.000	.696	.015

a. Design: Intercept + teach_mthd

b. Exact statistic

The researcher conducted an additional MANOVA to determine if removing the outliers would impact the results. The MANOVA with outliers removed were also found not statistically

significant at a 95% confidence level since Wilk's $\Lambda = .995$; $F(3, 91) = .155$; $p = 0.926$; $\eta^2 = 0.005$ (see Table 8).

Table 8

Multivariate Tests for Teacher Sense of Efficacy, Overall, Student Engagement, Instructional Strategies, and Classroom Management

Multivariate Tests[a]

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
Intercept	Pillai's Trace	.991	3287.725[b]	3.000	91.000	.000	.991
	Wilks' Lambda	.009	3287.725[b]	3.000	91.000	.000	.991
	Hotelling's Trace	108.387	3287.725[b]	3.000	91.000	.000	.991
	Roy's Largest Root	108.387	3287.725[b]	3.000	91.000	.000	.991
teach_mthd	Pillai's Trace	.005	.155[b]	3.000	91.000	.926	.005
	Wilks' Lambda	.995	.155[b]	3.000	91.000	.926	.005
	Hotelling's Trace	.005	.155[b]	3.000	91.000	.926	.005
	Roy's Largest Root	.005	.155[b]	3.000	91.000	.926	.005

a. Design: Intercept + teach_mthd

b. Exact statistic

CHAPTER FIVE: CONCLUSIONS

Overview

The purpose of this causal-comparative study was to employ Albert Bandura's theory of self-efficacy, to determine if there was a statistically significant difference in high school teacher efficacy beliefs of teachers who teach with the Learning Management System (LMS), Schoology, and teachers who traditionally teach (without Schoology), as measured by the Teacher Sense of Efficacy Scale (Tschannen-Moran & Hoy, 2001). The scale measured teachers' scores on teacher efficacy overall, teacher efficacy in student engagement, teacher efficacy in instructional strategies, and teacher efficacy in classroom management. High school teachers had four weeks to respond to the scale. Of the participants who completed the scale, a random sample of 50 participants was taken from each group, for a total of 100 teachers in the sample. In Chapter Four, the researcher conducted a one-way multivariate analysis using the MANOVA test on SPSS software. The results of the multivariate test determined there was no statistically significant difference between the two groups, among the variables student engagement, instructional strategies, and classroom management. In this chapter, the results of the study, the implications, limitations, and recommendations for future studies about learning management systems will be discussed.

Discussion

The purpose of this causal comparative study was to employ Albert Bandura's (1977) theory of self-efficacy, in order to determine if there was a difference in teacher efficacy beliefs of high school teachers who implement the LMS, Schoology, and high school teachers who utilize traditional instruction. This study was aligned to one research question, which was the main focus of the study. Do high school teachers who utilize traditional instruction or teach with

the Learning Management System (LMS), Schoology, have a stronger sense of efficacy in any of the areas: student engagement, instructional strategies, or classroom management, as measured by the Teacher Sense of Efficacy Scale (TSES)? As a result of analyzing the data with the MANOVA, the test indicated that there was no statistically significant difference between efficacy beliefs of the traditional teachers and teachers who use Schoology with their students. Despite using two different methods to teach, the mean efficacy for both groups of teachers was on the Likert scale between "quite a bit" and "a great deal" in terms of how much teachers think they can do to impact the areas of student engagement, instructional strategies, and classroom management. The results are on the high end of the Likert scale, thus indicating teachers from both groups feel a strong sense of efficacy.

Overall, there is an abundance of studies on teacher efficacy; however, there are no studies that exist where teacher efficacy scores are compared among teachers who use an LMS and teachers who do not use an LMS. While there are no studies to compare the direct findings of this study, it is still essential to review studies who used teacher efficacy. Since this study employs Bandura's (1977) theory of self-efficacy, it is important to compare the results of this study with other studies of similar topics, in particular, teacher efficacy with technology. Specifically, in Kale and Goh's (2012) study, the researchers analyzed teacher efficacy and technology use to understand teachers' comfort and confidence levels of using technology with students. The results of Kale and Goh's study was consistent with the results of the current study since their data showed that teachers who have high levels of efficacy will adopt technology in their classroom. Therefore, it can be implied that the teachers who used Schoology in the current study have a high level of teacher sense of efficacy and felt comfortable adopting Schoology in their classroom. Kale and Goh (2012) also reported that from a teacher's viewpoint, student and

teaching needs are most important to teachers in general, which is why any program that can help educators innovate and work efficiently is what educators will desire to use.

Since both groups of teachers, traditional instruction teachers and teachers who use Schoology, feel efficacious in their teaching positions, it is important to compare the results to similar studies that looked at teachers' technology self-efficacy. In Holden and Rada's (2011) study, the researchers determined from their sample population (n = 378) that "teachers' technology self-efficacy had a significantly direct effect on perceived ease of use + usability" (p. 360). Holden and Rada's (2011) findings suggest that in the present study, teachers who utilize Schoology in their classroom perceive it to be user-friendly and easy to implement. Therefore, Schoology use in the high school environment should be looked at by administrators as a technology tool that teachers would potentially accept and use in their classrooms. EL-Daou's (2016) study similarly supported Holden and Rada's (2011) results as EL-Daou's (2016) findings determined that how familiar a teacher is with a type of technology will significantly add to their teacher efficacy beliefs and support student learning.

Furthermore, Heath (2017) studied teacher implementation of one-to-one technology integration to recognize the barriers that prevent teachers from trying new technologies in the classroom and identify teacher beliefs that empower teachers to use technology. Heath's (2017) research determined that a positive belief in technology and a teacher's strong sense of efficacy as a teaching professional would advance the use of technology initiatives in their classrooms. Therefore, the current study adds to the existing body of literature because it can conclude that teachers positively believe that they can implement technology in their classrooms successfully. Factors that influence positive belief in technology and teacher efficacy should continue to be studied, if technology is going to be a part of a pedagogical change that increases student

achievement in schools.

Exploring studies where teachers reported high levels of efficacy while using technology is important to the current study in order to understand why teachers felt efficacious using Schoology. Tilton and Hartnett's (2016) study specifically researched the influences on teacher efficacy, while using technology. The researchers found that allowing teachers time to explore technology within a professional development group or independently, greatly impacted their confidence level of integrating the technology in their classroom. Another influence on teacher efficacy was collective efficacy, which includes teachers and students working together to problem solve with the integrated technology as well as student learning and achievement. Therefore, teachers who collaborate with other teachers, as well as students to successfully implement technology will report higher levels of efficacy while integrating technology in their classroom. These factors are important to the current study because teachers' efficacy beliefs impact whether or not teachers will accept technological change in their classroom.

Overall, the current study is a contribution to the larger body of literature on teacher efficacy, but most importantly it adds to the growing amount of research on teacher efficacy beliefs while implementing LMSs in high schools. Identifying factors that impact teacher efficacy while utilizing technology in the classroom is important if technology is going to impact student achievement. Teachers are crucial components for pedagogical change in schools. However, for pedagogical change to increase student achievement, teacher efficacy beliefs need to be strong. Therefore, continued research on teacher efficacy beliefs and the latest technology pedagogy needs to occur.

Implications

The study implied that teaching with the LMS, Schoology, does not increase high school teacher sense of efficacy, as compared to traditional instruction; however, teacher efficacy of both groups was at the higher end of the Likert scale. Among the four areas of teacher efficacy that were analyzed including, overall teacher sense of efficacy, student engagement, instructional strategies, and classroom management, there was no significant difference between traditional instruction and teaching with Schoology. While there are many studies on teacher efficacy through the use of traditional instruction (Aldridge & Fraser, 2016; Aðalsteinsson, Frímannsdóttir, & Konráðsson, 2014; Brouwers & Tomic, 2000; Callaway, 2017; Cheung, 2008; Guskey, 1988; Hammack & Ivey, 2017; Hineman, Boury, & Semich, 2015; Holden & Rada, 2011; Holzberger, Philipp, & Kunter, 2014; Kilday, Lenser, & Miller, 2016; Künsting, Neuber, & Lipowsky, 2016; Lotter, Smiley, Thompson, & Dickenson, 2016; Mehdinezhad & Mansouri, 2016; Miller, Ramirez, & Murdock, 2017; Nurlu, 2015; Rahgozaran & Gholami, 2014; Rogers-Haverback & Mee, 2015; Ruan, Nie, Hong, Monobe, Zheng, Kambara, & You, 2015), this is the first research study known that analyzes high school teacher use of Schoology and its impact on their efficacy beliefs. Additionally, this is the first research study to use the Teacher Sense of Efficacy Scale (TSES) to assess teacher efficacy of high school teachers who use Schoology, therefore, the findings of this study add to the body of literature about teacher efficacy.

Beyond this study adding to the greater body of research, it demonstrates that teacher efficacy beliefs, whether using traditional instruction or Schoology, are a result of how capable a teacher feels they are in the classroom. The means and methods a teacher uses do not dictate how confident a teacher is in their ability to teach. This conclusion was determined as a result of the twenty-four questions that were included in the TSES, which analyzed beliefs a teacher had

in their ability to engage students, utilize a variety of instructional strategies, and manage their classroom.

The research findings from this study do not conflict with the literature that administrators should create a culture at their school districts where teachers feel efficacious. If teachers have strong efficacy beliefs, they will feel confident utilizing Schoology to manage courses in one-to-one classrooms (De Smet, Bourgonjon, De Wever, Schellens, & Valcke, 2012). The prior review of literature supports the need for professional development that focuses specifically on instructional strategies, classroom management, and student engagement, which will boost teacher efficacy beliefs regardless of the methods used.

Limitations

This study is one of the earliest studies to research Schoology and its impact on teacher efficacy. The findings in this study have limitations because how Schoology was implemented by teachers was not controlled. The first limitation and internal threat to validity was due to the uncertainty of exactly how Schoology was utilized by teachers. Exactly how each teacher used Schoology to implement instructional strategies is unknown. While Schoology offers tools, like rewarding students with badges, to help teachers with classroom management and student engagement, the strategies from Schoology that teachers implemented were not reported as a part of this study.

Moreover, the procedures of this study did not require teachers to use Schoology in their classroom for a specific amount of time; therefore, an additional limitation and internal threat to the study was the frequency of which Schoology was used in the classroom. While Schoology is an LMS that the teacher participants had access to, how often and to what capacity that they actually used it in the classroom is unknown.

The last limitation and threat to the validity of the study is the amount of professional development offered to the teachers who use Schoology varied among school districts. Teacher efficacy scores may have been impacted by school districts who educated teachers about how to effectively implement Schoology. When professional development is offered to an entire school, it increases support and change during the entire school year (Lotter, Smiley, Thompson, & Dickenson 2016).

Recommendations for Future Research

Since research on the topic of Learning Management Systems (LMS) is sparse, there are many appropriate recommendations for future research.

1. Specifically, in terms of populations, a future study should include participants who are more ethnically diverse. By studying an ethnically diverse population, the viewpoints of teachers with varying backgrounds may generate different findings. Ethnically diverse teachers may be influenced by their cultural backgrounds; thus, the relationship between LMSs and the teachers' overall feelings of efficacy may offer another dimension to the findings.

2. Another future research study could analyze teacher efficacy of other types of LMSs, other than Schoology. The data collected would help fill the gap of LMSs as a whole and their impact on K-12 education.

3. Future studies could also look at teacher efficacy in high school teachers where LMSs are implemented in K-12 online education versus in a face-to-face learning environment. The results could potentially provide legitimacy for the LMS as the sole provider for resources and communication in the online education learning environment.

4. Through shifting the focus from teacher responses to student responses, a study that focused on collecting feedback from students would offer a different perspective on LMSs. Since the students are ultimately the subjects who are most influenced by teachers' strategies, gaining insight from their learning experiences with LMSs is important.

5. Additionally, not only is it important to study student participants and their use of LMSs, but also, another study should focus on the academic achievement for those who utilize Schoology, or another LMS, versus traditional education. Possible achievement data could include standardized test scores, other state test scores, or SAT scores.

6. Another opportunity to further the field of research on LMSs in K-12 education would be to determine if LMSs impacted student preparedness for undergraduate education. A study on this topic may be a combination of qualitative and quantitative data, as it could include college enrollment percentages, observations, interviews, and undergraduate GPAs that compare high schools who use LMSs versus high schools that employ traditional education.

7. Furthermore, a study that assesses self-efficacy among student populations who use an LMS would be helpful in determining efficacy beliefs among students. The tool needed in this type of study would include a student self-efficacy scale for quantitative purposes, or this type of study could be conducted qualitatively through interviews, journaling, or other means of collecting thoughts and feelings of self-efficacy among students.

REFERENCES

Aidinopoulou, V., & Sampson, D. G. (2017). An action research study from implementing the

    flipped classroom model in primary school history teaching and learning. *Journal of*

    Educational Technology & Society, 20(1), 237-247. Retrieved from

    http://www.jstor.org/stable/jeductechsoci.20.1.237

Aldridge, J. M., & Fraser, B. J. (2016). Teachers' views of their school climate and its

    relationship with teacher self-efficacy and job satisfaction. *Learning Environments*

    Research, 19(2), 291-307. doi:10.1007/s10984-015-9198-x

Aloe, A. M., Amo, L. C., & Shanahan, M. E. (2014). Classroom management self-efficacy and

    burnout: A multivariate meta-analysis. *Educational Psychology Review, 26*(1), 101-126.

    doi:10.1007/s10648-013-9244-0

Altemueller, L., & Lindquist, C. (2017). Flipped classroom instruction for inclusive learning.

    British Journal of Special Education, 44(3), 341-358. doi:10.1111/1467-8578.12177

Alvarez, C., Alarcon, R., & Nussbaum, M. (2011). Implementing collaborative learning

    activities in the classroom supported by one-to-one mobile computing: A design-based

    process. *The Journal of Systems and Software, 84*(1), 1961-1976.

    doi:10.1016/j.jss.2011.07.011

Anshari, M., Alas, Y., & Guan, L. S. (2016). Developing online learning resources: Big data,

    social networks, and cloud computing to support pervasive knowledge. *Education and*

    Information Technologies, 21(6), 1663-1677. doi:10.1007/s10639-015-9407-3

Aðalsteinsson, R. I., Frímannsdóttir, I. B., & Konráðsson, S. (2014). Teachers' self-esteem and

    self-efficacy. *Scandinavian Journal of Educational Research, 58*(5), 540-550.

    doi:10.1080/00313831.2013.773559

Ardi, P. (2017). Promoting learner autonomy through Schoology m-learning platform in an eap

    class at an Indonesian university. *Teaching English with Technology, 17*(2), 55-76.

    Retrieved from http://www.tewtjournal.org

Atiles, J. T., Gresham, T. M., & Washburn, I. (2017). Values and beliefs regarding discipline

    practices: How school culture impacts teacher responses to student

    misbehavior. *Educational Research Quarterly, 40*(3), 3-24. Retrieved from

    http://www.erquarterly.org

Avogadro, P., Calegari, S., & Dominoni, M. A. (2016). Expert students in social learning

    management systems. *Interactive Technology and Smart Education, 13*(3), 202–217.

    doi:10.1108/itse-06-2016-0018

Azpiazu, I. M., Dragovic, N., Pera, M. S., & Fails, J. A. (2017). Online searching and learning:

    YUM and other search tools for children and teachers. *Information Retrieval

    Journal, 20*(5), 524-545. doi:10.1007/s10791-017-9310-1

Bandura, A., & Adams, N. (1977). Analysis of self-efficacy theory of behavioral change.

    Cognitive Therapy and Research, 1(4), 287-310. doi:10.1007/bf01663995

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change.

    Psychological Review, 84(2), 191-215. doi:10.1037//0033-295x.84.2.191

Bandura, A. (1993). Perceived self-efficacy in cognitive development and functioning.

    Educational Psychologist, 28(2), 117-148. doi:10.1207/s15326985ep2802_3

Bandura, A. (1997). *Self-efficacy: The exercise of control.* New York: W.H. Freeman.

Battersby, S., & Verdi, B. (2015). The culture of professional learning communities and

    connections to improve teacher efficacy and support student learning. *Arts Education

    Policy Review, 116*(1), 22-29. doi:10.1080/10632913.2015.970096

Broussard, J., Hebert, D., Welch, B., & VanMetre, S. (2014). Teaching today for tomorrow: A

    case study of one high school's 1:1 computer adoption. *Delta Kappa Gamma*

    Bulletin, 80(4), 37-45. Retrieved from http://www.dkg.org

Brouwers, A., & Tomic, W. (2000). A longitudinal study of teacher burnout and perceived self-

    efficacy in classroom management. *Teaching and Teacher Education, 16,* 239-253.

    doi:10.1016/s0742-051x(99)00057-8

Callaway, R. F. (2017). A correlational study of teacher efficacy and culturally responsive

    teaching techniques in a southeastern urban school district. *Journal of Organizational*

    and Educational Leadership, 2(2), 1-27. Retrieved from

    http://digitalcommons.gardner-webb.edu/joel/vol2/iss2/3

Carpenter, J. P., Trust, T., & Krutka, D. G. (2016). The virtual workroom. *Journal of*

    Staff Development, 37(4), 24-28,74. Retrieved from

    http://www.learningforward.org/news/jsd/index.cfm

Cheung, H. Y. (2008). Teacher efficacy: A comparative study of Hong Kong and Shanghai

    primary in-service teachers. *Australian Educational Researcher, 35*(1), 103-123.

    doi:10.1007/BF03216877

Chung-Yuan, H., Meng-Jung, T., Yu-Hsuan, C., & Jyh-Chong Liang. (2017). Surveying in-

    service teachers' beliefs about game-based learning and perceptions of technological

    pedagogical and content knowledge of games. *Journal of Educational Technology &*

    Society, 20(1), 134-143. Retrieved from

    http://www.jstor.org/stable/jeductechsoci.20.1.134

Cigdem, H., & Ozturk, M. (2016). Factors affecting students' behavioral intention to use LMS at

    a turkish post-secondary vocational school. *International Review of Research in Open*

and Distance Learning, 17(3), 312-317. doi:10.19173/irrodl.v17i3.2253

Cruz, F., Gálvez, I., & Santaolalla, R. (2016). Impact of quality management systems on teaching-learning processes. *Quality Assurance in Education*, *24*(3), 394-415. doi:10.1108/qae-09-2013-0037

De Oliveira, P., Cunha, C., & Nakayama, M. (2016). Learning management systems and e-learning management: An integrative review and research agenda. *Journal of Information Systems and Technology Management, 13*(2), 157-179. doi:10.4301/s1807-177520160002000001

De Smet, C., De Wever, B., Schellens, T., & Valcke, M. (2016). Differential impact of learning path based versus conventional instruction in science education. *Computers & Education*, *99*(1), 53-67. doi:10.1016/j.compedu.2016.04.001

De Smet, C., Bourgonjon, J., De Wever, B., Schellens, T., & Valcke, M. (2012). Researching instructional use and the technology acceptation of learning management systems by secondary school teachers. *Computers & Education, 58*(2), 688-696. doi:10.1016/j.compedu.2011.09.013

De Smet, C., Schellens, T., De Wever, B., Brandt-Pomares, P., & Valcke, M. (2016). The design and implementation of learning paths in a learning management system. *Interactive Learning Environments*, *24*(6), 1076-1096. doi:10.1080/10494820.2014. 951059

Dias, S., & Diniz, J. (2014). Towards an enhanced learning management system for blended learning in higher education incorporating distinct learners' profiles. *Journal of Educational Technology & Society, 17*(1), 307-319. Retrieved from http://www.jstor.org/stable/jedutechsoci.17.1.307

Dixon, F., Yssel, N., & McConnell, J. (2014). Differentiated instruction, professional development, and teacher efficacy. *Journal for the Education of the Gifted*, *37*(2), 111-127. doi:10.1177/0162353214529042

Duffin, L. C., French, B. F., & Patrick, H. (2012). The teachers' sense of efficacy scale: Confirming the factor structure with beginning pre-service teachers. *Teaching and Teacher Education, 28*(6), 827-834. doi:10.1016/j.tate.2012.03.004

Echazarra, A., Denis, V., Rech, G., Mendez, I., & Salinas, D. (2016). How teachers teach and students learn. *OECD Education Working Papers*. doi:10.1787/5jm29kpt0xxx-en

Edmunds, B., & Hartnett, M. (2014). Using a learning management system to personalise learning for primary school students. *Journal of Open, Flexible and Distance Learning*, *18*(1), 11-29. Retrieved from http://journals.akoaotearoa.ac.nz/index.php/JOFDL

EL-Daou, B. (2016). The effect of using in computer skills on teachers' perceived self-efficacy beliefs towards technology integration, attitudes and performance. *World Journal on Educational Technology, 8*(3), 294-306. doi:10.18844/wjet.v8i2.928

Fives, H., & Buehl, M. M. (2009). Examining the factor structure of the teachers' sense of efficacy scale. *The Journal of Experimental Education, 78*(1), 118-134. doi:10.1080/00220970903224461

Gall, M. D., Gall, J. P., & Borg, W. R. (2007). *Educational research: An introduction* (8th ed.). New York, NY: Allyn & Bacon.

Gonzalez, A. (2014). Strategies to get started with blended learning. *Voices from the Middle, 22*(2), 34-38. Retrieved from http://ncte.org/journals/vm/isses/v22-2

Guskey, T. (1988). Teacher efficacy, self-concept, and attitudes toward the implementation of instructional innovation. *Teaching and Teacher Education, 4*(1), 63-69.

doi:10.1016/0742-051X(88)90025-X

Guskey, T. (1989). Attitude and perceptual change in teachers. *International Journal of Educational Research, 13*(4), 439-454. doi:10.1016/0883-0355(89)90039-6

Haake, S. (2013). English in the cloud: the experience of one school in moving its curriculum and learning content online. *Literacy Learning: The Middle Years*, *21*(3), 41-48. Retrieved from https://search.informit.com.au/documentSummary;dn=630057846139651 ;res=IELHSS>

Hammack, R., & Ivey, T. (2017). Examining elementary teachers' engineering Self-Efficacy and engineering teacher efficacy. *School Science and Mathematics, 117*(1-2), 52-62. doi:10.1111/ssm.12205

Hardin, B. L., & Koppenhaver, D. A. (2016). Flipped professional development: An innovation in response to Teacher Insights. *Journal of Adolescent & Adult Literacy, 60*(1), 45-54. doi:10.1002/jaal.522

Haugen, J. M. (2015). Flexible learning days. *The Education Digest, 81*(1), 48-51. Retrieved from http://www.eddigest.com

Heath, M. (2017). Teacher-initiated one-to-one technology initiatives: How teacher self-efficacy and beliefs help overcome barrier thresholds to implementation. *Computers in the Schools*, *34*(1-2), 88-106. doi:10.1080/07380569.2017.1305879

Hemmings, B. C. (2015). Strengthening the teaching self-efficacy of early career academics. *Issues in Educational Research, 25*(1), 1-17. Retrieved from http://www.iier.org.au/iier25/hemmings.html

Hineman, J., Boury, T., & Semich, G. (2015). Technology-literate school leaders in a 1:1 iPad program and teachers' technology self-efficacy. *International Journal of Information*

and Communication Technology Education, 11(2), 68-79. doi:10.4018/

ijicte.2015040106

Ho, V., Nakamori, Y., Ho, T., & Lim, C. P. (2016). Blended learning model on hands-on

approach for in-service secondary school teachers: Combination of E-learning and face-

to-face discussion. *Education and Information Technologies, 21*(1), 185-208.

doi:10.1007/s10639-014-9315-y

Holden, H., & Rada, R. (2011). Understanding the influence of perceived usability and

technology self-efficacy on teachers' technology acceptance. *Journal of Research on

Technology in Education, 43*(4), 343-367. doi:10.1080/15391523.2011.

10782576

Holzberger, D., Philipp, A., & Kunter, M. (2014). Predicting teachers' instructional

behaviors: The interplay between self-efficacy and intrinsic needs. *Contemporary

Educational Psychology, 39*(2), 100-111. doi:10.1016/j.cedpsych.2014.02.001

Horn, M. B. (2012). Game changer. *Education Next, 12*(4), 93-94. Retrieved from

http://www.educationnext.org/game-changer/

Hsu, H., Wang, S., & Runco, L. (2013). Middle school science teachers' confidence and

pedagogical practice of new literacies. *Journal of Science Education and Technology,

22*(3), 314-324. doi:10.1007/s10956-012-9395-7

Hugerat, M. (2016). How teaching science using project-based learning strategies affects the

classroom learning environment. *Learning Environments Research, 19*(3), 383-395.

doi:10.1007/s10984-016-9212-y

Islam, M. S., & Grönlund, Å. (2016). An international literature review of 1:1 computing in

schools. *Journal of Educational Change, 17*(2), 191-222. doi:10.1007/s10833-

016-9271-y

Kale, U., & Goh, D. (2012). Teaching style, ICT experience and teachers' attitudes toward

teaching with web 2.0. *Education and Information Technologies, 19*(41), 41-60.

doi:10.1007/s10639-012-9210-3

Kaur, M. (2016). Teacher efficacy of secondary school teachers in relation to their teaching

competency. *Learning Community: An International Journal of Educational and Social

Development, 7*(3), 328-335. doi:10.5958/2230-7311.2017.00012.5

Keengwe, J. (2015). *Handbook of research on educational technology integration and active

learning*. Hershey: Information Science Reference, IGI Global.

Kilday, J., Lenser, M., & Miller, A. (2016). Considering students in teachers' self-efficacy:

Examination of a scale for student-oriented teaching. *Teaching and Teacher Education,

56*(2016), 61-71. doi:10.1016/j.tate.2016.01.025

Kompar, F. (2016). The trending librarian. *Teacher Librarian, 44*(1), 58-63. Retrieved from

https://www.highbeam.com/doc/1G1-469315275.html

Kong, S. (2011). An evaluation study of the use of a cognitive tool in a one-to-one classroom for

promoting classroom-based dialogic interaction. *Computers & Education, 57*(2011),

1851-1864. doi:10.1016/j.compedu.2011.04.008

Künsting, J., Neuber, V., & Lipowsky, F. (2016). Teacher self-efficacy as a long-term predictor

of instructional quality in the classroom. *European Journal of Psychology of

Education, 31*(3), 299-322. doi:10.1007/s10212-015-0272-7

Lee, E., & Hannafin, M. J. (2016). A design framework for enhancing engagement in student-

centered learning: Own it, learn it, and share it. *Educational Technology, Research and

Development, 64*(4), 707-734. doi:10.1007/s11423-015-9422-5

Levin, H. M. (2015). The importance of adaptability for the 21st century. *Society, 52*(2), 136-141. doi:10.1007/s12115-015-9874-6

Livingston, P. (2005). Reflections on the effects of one-to-one computing in a middle school. *Learning & Leading with Technology, 33*(4), 21-22. Retrieved from http://iste.org

Lochner, B., Conrad, R., & Graham, E. (2015). Secondary teachers' concerns in adopting learning management systems: A U.S. perspective. *TechTrends, 59*(5), 62-70. doi:10.1007/s11528-015-0892-4

Lotter, C., Smiley, W., Thompson, S., & Dickenson, T. (2016). The impact of a professional development model on middle school science teachers' efficacy and implementation of inquiry. *International Journal of Science Education, 38*(18), 2712-2741. doi:10.1080/09500693.2016.1259535

Lowther, D., Inan, E., Ross, S., & Strahl, J. (2012). Do one-to-one initiatives bridge the way to 21st century skills? *Journal of Educational Computing Research, 46*(1), 1-30. doi:10.2190/ec.46.1.a

Mandeville, D., & Stoner, M. (2015). Research and teaching: Assessing the effect of problem-based learning on undergraduate student learning in biomechanics. *Journal of College Science Teaching, 45*(1), 66-75. doi:10.2505/4/jcst15_045_01_66

Mbuva, J. M. (2015). Examining the effectiveness of online educational technological tools for teaching and learning and the challenges ahead. *Journal of Higher Education Theory and Practice, 15*(2), 113-127. Retrieved from http://www.-na-businesspress.com/jhetopen.html

Mehdinezhad, V., & Mansouri, M. (2016). School principals' leadership behaviours and its

relation with teachers' sense of self-efficacy. *International Journal of Instruction, 9*(2), 51-60. doi:10.12973/iji.2016.924a

Mehta, J., & Fine, S. (2015). Bringing values back in: How purposes shape practices in coherent school designs. *Journal of Educational Change, 16*(4), 483-510. doi:10.1007/s10833-015-9263-3

Mei Lick, C., & Su Luan, W. (2015). Predictors of e-learning satisfaction in teaching and learning for school teachers: A literature review. *International Journal of Instruction, 8*(1), 75-90. doi:10.12973/iji.2015.816a

Miller, A., Ramirez, E., & Murdock, T. (2017). The influence of teachers' self-efficacy on perceptions: Perceived teacher competence and respect and student effort and achievement. *Teaching and Teacher Education, 64*(2017), 260-269. doi:10.1016/j.tate.2017.02.008

Murray, E. (2015). Piloting the learning commons: Coteaching and collaboration between a classroom teacher and a teacher librarian. *Teacher Librarian, 43*(1), 18-24. Retrieved from https://www.highbeam.com/doc/1G1-433385848.html

Nurlu, Ö. (2015). Investigation of teachers' mathematics teaching self-efficacy. *International Electronic Journal of Elementary Education, 8*(1), 21-39. Retrieved from http://www.iejee.com

O'Brennan, L., Pas, E., & Bradshaw, C. (2017). Multilevel examination of burnout among high school staff: Importance of staff and school factors. *School Psychology Review, 46*(2), 165-176. doi:10.17105/SPR-2015-0019.V46-2

Ozer, E., & Bandura, A. (1990). Mechanisms governing empowerment effects: A self-efficacy analysis. *Journal of Personality and Social Psychology, 58*(3), 472-486.

doi:10.1037/0022-3514.58.3.472

Penuel, W. (2006). Implementation and effects of one-to-one computing initiatives: A research

synthesis. *Journal of Research on Technology in Education, 38*(3), 329-348.

doi:10.1080/15391523.2006.10782463

Pierce, G. L., & Cleary, P. F. (2016;2014;). The K-12 educational technology value chain: Apps

for kids, tools for teachers and levers for reform. *Education and Information*

Technologies, 21(4), 863-880. doi:10.1007/s10639-014-9357-1

Power, R. L., Cristol, D., Gimbert, B., Bartoletti, R., & Kilgore, W. (2016). Using the mTSES to

evaluate and optimize mLearning professional development.*International Review of*

Research in Open and Distance Learning, 17(4), 350-385.

doi:10.19173/irrodl.v17i4.2459

Prensky, M. (2001). Digital natives, digital immigrants part 1. *On the Horizon, 9*(5), 1-6.

doi:10.1108/10748120110424816

Rahgozaran, H., & Gholami, H. (2014). The impact of teachers' reflective journal writing on

their self-efficacy. *Modern Journal of Language Teaching Methods, 4*(2), 65-74.

Retrieved from http://www.mjltm.org

Richardson, J. W., Beck, D., LaFrance, J., & McLeod, S. (2016). Job attainment and perceived

role differences of cyberschool leaders. *Journal of Educational Technology &*

Society, 19(1), 211-222. Retrieved from https://creativecommons.org/licenses/by-nc-

nd/3.0/

Rico, R., & Ertmer, P. (2015). Examining the role of the instructor in problem-centered

instruction. *Tech Trends, 59(*4), 96-103. doi:10.1007/s11528-015-0876-4

Ridge, H. (2014). Integrating literacy into CTE classes. *Tech Directions, 74*(4), 18-21. Retrieved

from http://www.techdirections.com

Robinson, C. (2017). Technology tools for a paperless classroom. *Science Scope, 41*(3), 18-21. doi:10.2505/4/ss17_041_03_18

Rogers-Haverback, H., & Mee, M. (2015). Reading and teaching in an urban middle school: Preservice teachers' self-efficacy beliefs and field-based experiences. *Middle Grades Research Journal, 10*(1), 17-30. Retrieved from http://www.infoagepub.com/middle-grades-research-journal.html

Rotter, J. B. (1966). Generalized expectancies for internal versus external control of reinforcement. *Psychological Monographs, 80*(1), 1-28. doi:10.1037/h0092976

Ruan, J., Nie, Y., Hong, J., Monobe, G., Zheng, G., Kambara, H., & You, S. (2015). Cross-cultural validation of teachers' sense of efficacy scale in three Asian countries: Test of measurement invariance. *Journal of Psychoeducational Assessment, 33*(8), 769-779. doi:10.1177/0734282915574021

Sahin, A., Top, N., & Delen, E. (2016). Teachers' first-year experience with chromebook laptops and their attitudes towards technology integration. *Technology, Knowledge and Learning, 21*(3), 361-378. doi:10.1007/s10758-016-9277-9

Saine, P., & West, J. (2017). Content area teacher candidates' self-efficacy beliefs of teaching writing online. *Journal of Digital Learning in Teacher Education, 33*(2), 69-77. doi:10.1080/21532974.2017.1280433

Sandholtz, J., & Ringstaff, C. (2014). Inspiring instructional change in elementary school science: The relationship between enhanced self-efficacy and teacher practices. *Journal of Science Teacher Education, 25*(6), 729-751. doi:10.1007/s10972-014-9393-0

Scott, R., & Meeussen, N. (2017). Self-regulated learning: A touchstone for technology-

enhanced classrooms. *The Reading Teacher, 70*(6), 659-666.

    doi:10.1002/trtr.1564

Shoulders, T., & Krei, M. (2015). Rural high school teachers' self-efficacy in student

    engagement, instructional strategies, and classroom management. *American Secondary*

    Education, 44(1), 50-61. Retrieved from http://www.ashland.edu/ase

Staker, H., & Horn, M. B. (2012). Classifying K-12 blended learning. Retrieved from

    http://www.christenseninstitute.org/wp-content/uploads/2013/04/Classifying-K-12-

    blended-learning.pdf

Stewart, T. (2012). Classroom teacher leadership: Service-learning for teacher sense of efficacy

    and servant leadership development. *School Leadership & Management, 32*(3), 233-259.

    doi:10.1080/13632434.2012.688741

Suana, W., Maharta, N., I D. P. Nyeneng, & Wahyuni, S. (2017). Design and implementation of

    schoology-based blended learning media for basic physics I course. *Jurnal Pendidikan IPA*

    Indonesia, 6(1), 170-178. doi:10.15294/jpii.v6i1.8648

Sullivan, S. C., & Downey, J. A., P.H.D. (2015). Shifting educational paradigms: From

    traditional to competency-based education for diverse learners. *American Secondary*

    Education, 43(3), 4-19. Retrieved from http://www.ashland.edu/ase

Tech & Learning. (2017). Learning management systems: A Sampling. Retrieved January 31,

    2018, from https://www.techlearning.com/resources/learning-management-systems-a-

    sampling

Thomas, A. F. (2015). Enhancing nonfiction reading comprehension through online book

    discussions. *Reading Horizons (Online), 54*(2), 67-90. Retrieved from

    http://scholarworks.wmich.edu/reading_horizons/

Tilton, J., & Hartnett, M. (2016). What are the influences on teacher mobile technology self-efficacy in secondary school classrooms? *Journal of Open, Flexible and Distance Learning, 20*(2), 79-93. Retrieved from http://journals.akoaotearoa.ac.nz/index.php/JOFDL

Toppin, I. N., & Toppin, S. M. (2016). Virtual schools: The changing landscape of K-12 education in the U.S. *Education and Information Technologies*, *21*(6), 1571-1581. doi:10.1007/s10639-015-9402-8

Tsai, P., Tsai, C., & Hwang, G. (2015). The effects of instructional methods on students' learning outcomes requiring different cognitive abilities: Context-aware ubiquitous learning versus traditional instruction. *Interactive Learning Environments, 24*(7), 1497-1510. doi:10.1080/10494820.2015.1035730

Tschannen-Moran, M., & McMaster, P. (2009). Sources of self-efficacy: Four professional development formats and their relationship to self-efficacy and implementation of a new teaching strategy. *The Elementary School Journal, 110*(2), 228-245. doi:10.1086/605771

Tschannen-Moran, M., & Woolfolk Hoy, A. (2001). Teacher efficacy: Capturing an elusive construct. *Teaching and Teacher Education, 17*(2001), 783-805. doi:10.1016/s0742-051x(01)00036-1

Tschannen-Moran, M., Woolfolk Hoy, A., & Hoy, W. K. (1998). Teacher efficacy: Its meaning and measure. *Review of Educational Research ,68*(2), 202-248. doi:10.2307/1170754

Turel, V. (2014). Teachers' computer self-efficacy and their use of educational technology. *Turkish Online Journal of Distance Education, 15*(4), 130-149. doi:10.17718/tojde.81990

U.S. Census Bureau (2016). *Quick Facts Carbon County, Northampton County, Monroe County,*

Pennsylvania 2010-2016.

https://www.census.gov/quickfacts/fact/table/carboncountypennsylvania,northamptoncou

ntypennsylvania,monroecountypennsylvania/PST045217

van Deursen, A. J., A, , M., Ben Allouch, S., & Ruijter, L. P. (2016). Tablet use in primary

education: Adoption hurdles and attitude determinants. *Education and Information*

Technologies, 21(5), 971-990. doi:10.1007/s10639-014-9363-3

Von Bitter, M., & Turley, K. (2016). Deaf history, digital technology, and content-area literacy:

Instructional strategies for secondary classrooms. *Sign Language Studies, 17*(1), 78-84.

doi:10.1353/sls.2016.0025

Wang, L., Jen-yi, L., Tan, L., Tan, I., Lim, X., & Wu, B. S. (2016). Unpacking high and low

efficacy teachers' task analysis and competence assessment in teaching low-achieving

students in secondary schools. *Australian Educational Researcher, 43*(2), 165-183.

doi:10.1007/s13384-015-0196-x

Warner, R. M. (2013). *Applied statistics: From bivariate through multivariate techniques.* (2nd

ed.). Thousand Oaks, CA: Sage Publications.

Wiesman, J. (2016). Exploring novice and experienced teachers' perceptions of motivational

constructs with adolescent students. *American Secondary Education, 44*(2), 4-20.

Retrieved from http://www.ashland.edu/ase

Wong, G. K., (2016). The behavioral intentions of Hong Kong primary teachers in adopting

educational technology. *Educational Technology, Research and Development, 64*(2),

313-338. doi:10.1007/s11423-016-9426-9

Woodcock, S., Sisco, A., & Eady, M. (2015). The learning experience: Training teachers using

online synchronous environments. *Journal of Educational Research and Practice, 5*(1),

21-34. doi:10.5590/JERAP.2015.05.1.02

Xie, K., Kim, M. K., Cheng, S., & Luthy, N. C. (2017). Teacher professional development through digital content evaluation. *Educational Technology Research and Development, 65*(4), 1067-1103. doi:10.1007/s11423-017-9519-0

Yadav, A., Hong, H., & Stephenson, C. (2016). Computational thinking for all: Pedagogical approaches to embedding 21st century problem solving in K-12 classrooms. *TechTrends, 60*(6), 565-568. doi:10.1007/s11528-016-0087-7

Yildirim, Z., Reigeluth, C., Kwon, S., Kageto, Y., & Shao, Z. (2014). A comparison of learning management systems in a school district: searching for the ideal personalized integrated educational system. *Interactive Learning Environments, 22*(6), 721-736. doi:10.1080/10494820.2012.745423

Yoo, J. H. (2016). The effect of professional development on teacher efficacy and teachers' self-analysis of their efficacy change. *Journal of Teacher Education for Sustainability, 18*(1), 84-94. doi:10.1515/jtes-2016-0007

Zee, M., & Koomen, H. (2016). Teacher self-efficacy and its effects on classroom processes, student academic adjustment, and teacher well-being. *Review of Educational Research, 86*(4), 981-1015. doi:10.3102/0034654315626801

Zimmerman, B., Bandura, A., & Martinez-Pons, M. (1992). Self-Motivation for Academic Attainment: The Role of Self-Efficacy Beliefs and Personal Goal Setting. *American Educational Research Journal, 29*(3), 663-676. doi:10.2307/1163261

APPENDIX A

COLLEGE OF EDUCATION AND HUMAN ECOLOGY

THE OHIO STATE UNIVERSITY

ANITA WOOLFOLK HOY, PH.D.

PROFESSOR
PSYCHOLOGICAL STUDIES IN EDUCATION

Dear Kelly Backenstoe

You have my permission to use the *Teachers' Sense of Efficacy Scale* in your research. A copy the scoring instructions can be found at:

http://u.osu.edu/hoy.17/research/instruments/

Best wishes in your work,

Anita Woolfolk Hoy, Ph.D.
Professor Emeritus

APPENDIX B

Dear Superintendent:

As a graduate student in the School of Education at Liberty University, I am conducting research as part of the requirements for a doctoral degree. The title of my research project is 'High School Teachers' Sense of Efficacy: Traditional Teaching vs. Teaching with a Learning Management System and the purpose of my research is to compare teacher efficacy beliefs of high school teachers who implement the Learning Management System, Schoology, and those who do not. The study will assist in determining if teacher efficacy differs between the groups to help better understand the impact of implementing an LMS on teacher efficacy.

I am writing to request your permission to contact members of your teaching staff via email to invite them to participate in my research study.

Participants will be asked to go to a webpage with a survey and click on the link provided. Participants will be presented with informed consent information prior to participating. Taking part in this study is completely voluntary, and participants are welcome to discontinue participation at any time.

With your permission, I will email your high school teachers an electronic link to the survey. All of the data that I collect will be used for research purposes only and your staff members' results will remain anonymous. Throughout my dissertation, I will use pseudonyms for school districts to ensure confidentiality.

The survey begins with background information about the participant's demographics, then the twenty-four-question survey (Teacher's Sense of Efficacy Scale) will follow. The survey will take about 10 minutes for teachers to complete.

Thank you for considering my request. If you choose to grant permission, please provide a signed statement on official letterhead indicating your approval.

Sincerely,

Kelly Backenstoe

APPENDIX C

CONSENT FORM
HIGH SCHOOL TEACHERS' SENSE OF EFFICACY: TRADITIONAL TEACHING VS. TEACHING WITH A LEARNING MANAGEMENT SYSTEM
Kelly Backenstoe, M.S.Ed.
Liberty University
Graduate School of Education

You are invited to be a participant in a research study of teacher efficacy beliefs. You were selected as a possible participant because you are a high school teacher. Please read this form and email me with any questions you have, prior to agreeing to be a part of this study.

Kelly Backenstoe, a doctoral candidate in the School of Education at Liberty University, is conducting this study.

Background Information:
The purpose of this study is to compare teacher efficacy beliefs of high school teachers who implement the Learning Management System, Schoology, and those who do not. The study will assist in determining if teacher efficacy differs between the groups to help better understand the impact of implementing an LMS on teacher efficacy.

Procedures:
If you agree to be in this study, I would ask you to do the following things:

1. Click on the **Next** button at the bottom of this page and complete the introduction/demographic questions (2 minutes).

2. Once you have completed the introduction/demographic questions, complete the 24 teacher efficacy questions (8 minutes).

It should take approximately 10 minutes for you to complete the survey. Your participation will be completely anonymous, and no personal, identifying information will be collected.

Risks:
There are minimal risks of participation in this study, as in there is no more risk than a participant would find in normal life. The findings of the research will help researchers and administrators improve the professional development opportunities offered to high school teachers.

Benefits:
Participants should not expect to receive a direct benefit from taking part in this study.

Compensation:
As a thank you for participating, participants will voluntarily have the opportunity to be entered in a raffle to win one of three $10 Dunkin' Donuts gift cards. Each district will have three winners. Winners will receive their gift card within two months of completing the survey. All personal entries will be kept confidential and will not be tied to survey results. Email addresses

will be requested for compensation purposes, however they will be pulled and separated from your responses by SurveyMonkey to maintain anonymity.

Confidentiality:
The records of this study will be kept private. In any sort of report I might publish, I will not include any information that will make it possible to identify a subject. Research records will be stored securely, and only the researcher will have access to the records. School districts will be assigned pseudonyms. Data will be stored on a password locked computer and may be used in future presentations. After three years, all electronic records will be deleted.

Voluntary Nature of the Study:
Participation in this study is voluntary. Your decision whether or not to participate will not affect your current or future relations with Liberty University or your school district. If you decide to participate, you are free to not answer any questions or withdraw from the survey at any time by clicking the **Exit** button on the survey, without affecting those relationships.

How to Withdraw from the Study:
If you choose to withdraw from the study, please exit the survey and close your internet browser. Your responses will not be recorded or included in the study.

Contacts and Questions:
The researcher conducting this study is Kelly Backenstoe. You may ask any questions you have now. If you have questions later, **you are encouraged** to contact her at ▮▮▮▮▮▮▮▮, or via email at ▮▮▮▮▮▮▮▮▮▮▮▮. You may also contact the researcher's faculty chair, Dr. Gary Kuhne, at ▮▮▮▮▮▮▮▮▮▮.

If you have any questions regarding this study and you would like to talk with someone other than the researcher, **you are encouraged** to contact the Institutional Review Board, 1971 University Blvd, Green Hall Ste. 1887, Lynchburg, VA 24515 or email ▮▮▮▮▮▮▮▮▮▮.

Please notify the researcher if you would like a copy of this information for your records.

Statement of Consent:
I have read and understood the information above. I have asked and have received answers to any questions. I consent to participate in the study.

Click on the **Next** button, to indicate that you have read the consent information and would like to take part in the survey.

APPENDIX D

Link to Teacher Sense of Efficacy Survey (long-form only will be used).

http://u.osu.edu/hoy.17/files/2014/09/TSES-+-scoring-zted8m.pdf

APPENDIX E

Demographic Section of Survey

* 1. Are you a teacher

    ◯ Yes

    ◯ No

1. As a 'thank you' for your participation, if you would like to be entered in a raffle to win one of three $10 Dunkin' Donuts gift cards from your school district's survey participants, then please enter your name and personal email address below. Winners will receive their gift card within two months of completing the survey. All personal entries will be kept confidential and will not be tied to survey results.

Name	
Email Address	
School District	

* 2. Which school district do you work for?

☐

☐

☐

☐

☐
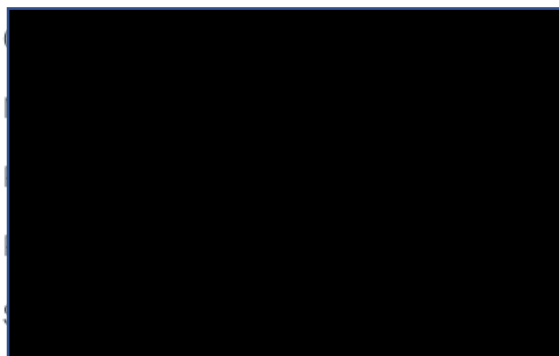
* 3. Does your school district use Schoology?
Schoology is a Learning Management System that
provides tools to develop engaging content, create
lessons, and assess student learning.

○ Yes

○ No

* 4. What is your age?

○ 20-29 years old

○ 30-39 years old

○ 40-49 years old

○ 50-59 years old

○ 60-69 years old

○ 70-79 years old

○ 80-89 years old

○ Other (please specify)

* 5. What is your gender?

◯ Female

◯ Male

* 6. What is your ethnic background?

☐ African American

☐ Asian

☐ Caucasian

☐ Hispanic

☐ Other (please specify)

[   ]

* 7. Which subject(s) do you teach? Check all that apply.

☐ Art

☐ English

☐ Mathematics

☐ Music

☐ Physical Education

☐ Reading

☐ Science

☐ Social Studies

☐ Technology

☐ Other (please specify)

[   ]

* 8. Which grade(s) do you teach? Check all that apply.

- ☐ 9th
- ☐ 10th
- ☐ 11th
- ☐ 12th

* 9. How many years have you been teaching?

- ○ 0-9 years
- ○ 10-19 years
- ○ 20-29 years
- ○ 30-39 years
- ○ 40-49+ years

*Required questions

APPENDIX F

Initial Recruitment Email

Date
High School Teacher
School District
Address

Dear Teacher:

As a doctoral candidate in the School of Education at Liberty University, I am conducting research to better understand teacher efficacy. Your superintendent has given me permission to contact you. The purpose of my research is to compare teacher efficacy beliefs of high school teachers who implement the Learning Management System (LMS), Schoology, and those who do not. The study will assist in determining if teacher efficacy differs between the groups to help better understand the impact of implementing an LMS on teacher efficacy. Two weeks ago an email was sent to you inviting you to participate in a research study. This follow-up email is being sent to remind you to complete the survey if you would like to participate and have not already done so. The deadline for participation is.

If you choose to participate, you will be asked to take a survey, which will include demographic information and teacher efficacy questions. It should take approximately 10 minutes for you to complete the procedures listed. Your participation will be completely anonymous, and no personal, identifying information will be required.

To participate, click on the link provided below to read the consent document, which will then take you to the survey.

A consent document is provided as the first page you will see after you click on the survey link. The informed consent document contains additional information about my research. Please click on the survey link at the end of the consent information to indicate that you have read the consent information and would like to take part in the survey.

If you choose to participate, you will have the option to be entered to win one of three $10 Dunkin' Donuts gift cards. Three winners will be drawn out of each district's pool of participants. You can enter the raffle after you complete the survey.

To participate, please click on this link:
active link to be added

Please complete the survey within the next two weeks.

Thank you for your time.

Sincerely,

Kelly Backenstoe

Doctoral Candidate

APPENDIX G

Follow-up Recruitment Email

Date
High School Teacher
School District
Address

Dear Teacher:

As a doctoral candidate in the School of Education at Liberty University, I am conducting research to better understand teacher efficacy. Your superintendent has given me permission to contact you. The purpose of my research is to compare teacher efficacy beliefs of high school teachers who implement the Learning Management System (LMS), Schoology, and those who do not. The study will assist in determining if teacher efficacy differs between the groups to help better understand the impact of implementing an LMS on teacher efficacy. Two weeks ago an email was sent to you inviting you to participate in a research study. This follow-up email is being sent to remind you to complete the survey if you would like to participate and have not already done so. The deadline for participation is .

If you choose to participate, you will be asked to take a survey, which will include demographic information and teacher efficacy questions. It should take approximately 10 minutes for you to complete the procedures listed. Your participation will be completely anonymous, and no personal, identifying information will be required.

To participate, click on the link provided below to read the consent document, which will then take you to the survey.

A consent document is provided as the first page you will see after you click on the survey link. The informed consent document contains additional information about my research. Please click on the survey link at the end of the consent information to indicate that you have read the consent information and would like to take part in the survey.

If you choose to participate, you will have the option to be entered to win one of three $10 Dunkin' Donuts gift cards. Three winners will be drawn out of each district's pool of participants. You can enter the raffle after you complete the survey.

To participate, please click on this link:
active link to be added

Please complete the survey within the next two weeks.

Thank you for your time.

Sincerely,

Kelly Backenstoe

████████████████████

Doctoral Candidate

Appendix H

LIBERTY UNIVERSITY.
INSTITUTIONAL REVIEW BOARD

July 3, 2018

Kelly Backenstoe
IRB Exemption 3336.070318: High School Teachers' Sense of Efficacy: Traditional Teaching vs. Teaching with a Learning Management System

Dear Kelly Backenstoe,

The Liberty University Institutional Review Board has reviewed your application in accordance with the Office for Human Research Protections (OHRP) and Food and Drug Administration (FDA) regulations and finds your study to be exempt from further IRB review. This means you may begin your research with the data safeguarding methods mentioned in your approved application, and no further IRB oversight is required.

Your study falls under exemption category 46.101(b)(2), which identifies specific situations in which human participants research is exempt from the policy set forth in 45 CFR 46:101(b):

> (2) Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior, unless:
> (i) information obtained is recorded in such a manner that human subjects can be identified, directly or through identifiers linked to the subjects; and (ii) any disclosure of the human subjects' responses outside the research could reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects' financial standing, employability, or reputation.

Please note that this exemption only applies to your current research application, and any changes to your protocol must be reported to the Liberty IRB for verification of continued exemption status. You may report these changes by submitting a change in protocol form or a new application to the IRB and referencing the above IRB Exemption number.

If you have any questions about this exemption or need assistance in determining whether possible changes to your protocol would change your exemption status, please email us at
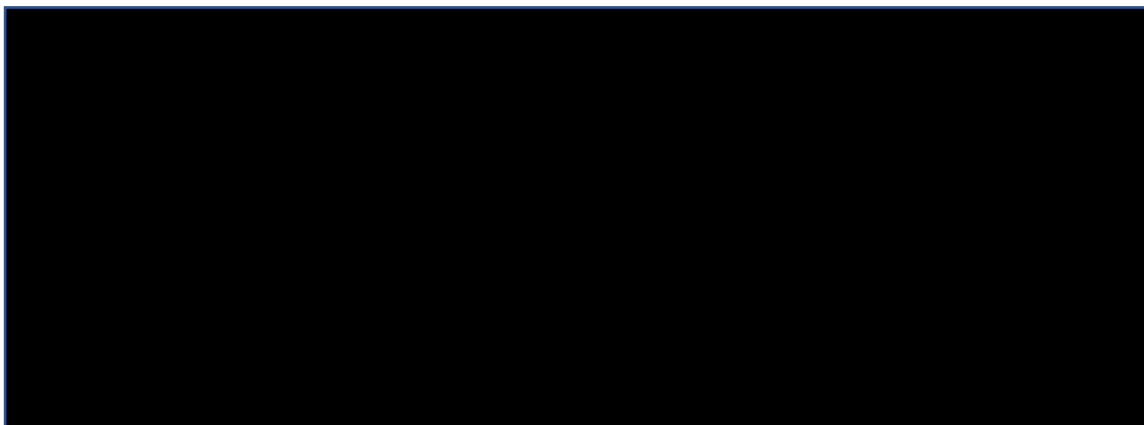
Sincerely,

G. Michele Baker, MA, CIP
Administrative Chair of Institutional Research
The Graduate School

LIBERTY
UNIVERSITY.
Liberty University | Training Champions for Christ since 1971

Appendix I


July 19, 2018

Ms. Kelly Backenstoe

Dear Ms. Backenstoe,

The purpose of this communication is to serve as authorization to conduct your research project entitled 'High School Teachers' Sense of Efficacy: Traditional Teaching vs. Teaching with a Learning Management System. This authorization will allow you to reach out to our ██████████████████ email, to invite them to participate in your 10 minute research project.

You are also authorized to email the high school staff directly, the link to complete your survey consisting of an initial participant demographic information request, and the additional twenty four (24) response questions.

For the high school staff who are interested in participating in your research, please ensure their anonymity, when collecting and gathering the data during the collection period commencing in September and concluding in October (over a 4 week time period).
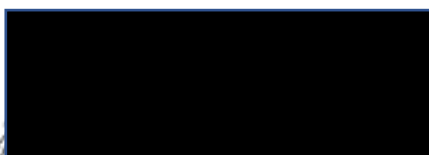
Superintendent

RJS/lmt
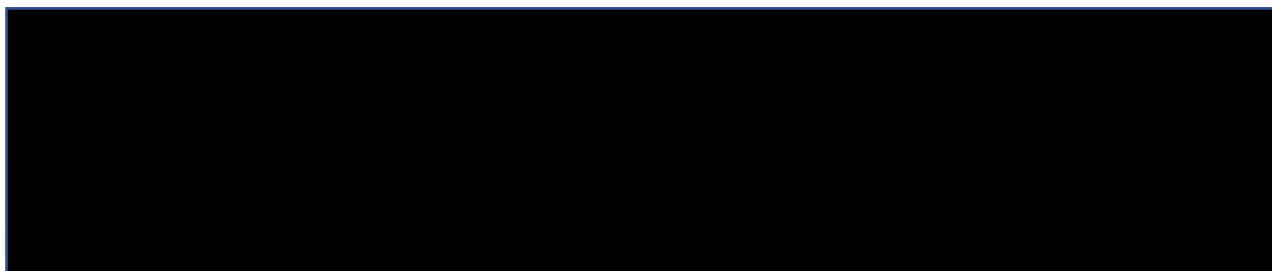
Appendix J
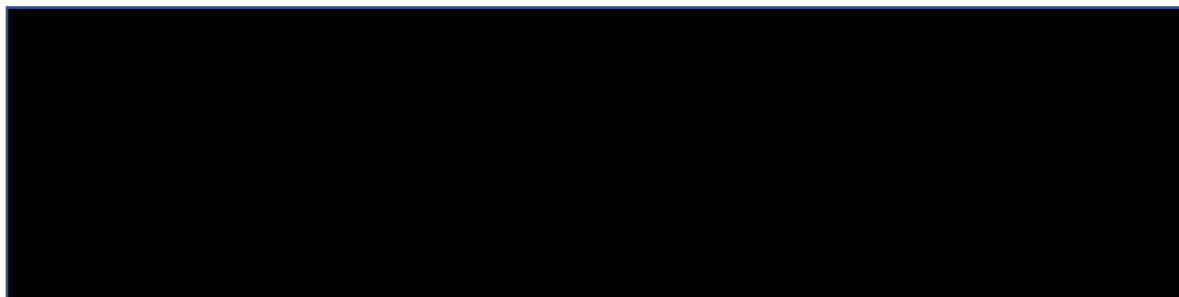
May 3, 2018

Ms. Kelly Backenstoe

Dear Ms. Backenstoe:

I am in receipt of your letter dated May 1, 2018, requesting permission to survey teachers at ▮▮▮▮▮▮▮▮▮▮▮ in conjunction with your doctoral research project entitled "High School Teachers' Sense of Efficacy: Traditional Teaching vs. Teaching with a Learning Management System". I am pleased to inform you that I have approved your request.

Please contact ▮▮▮▮▮▮, High School principal, to arrange for proper notification and consent from the involved teachers. If you have any questions or require any additional information, please do not hesitate to contact me.

Thank you for your interest in the ▮▮▮▮▮▮▮▮▮▮.

Sincerely,

Superintendent of Schools

Enclosure

Cc: ▮▮▮▮▮▮▮▮▮▮

Appendix K
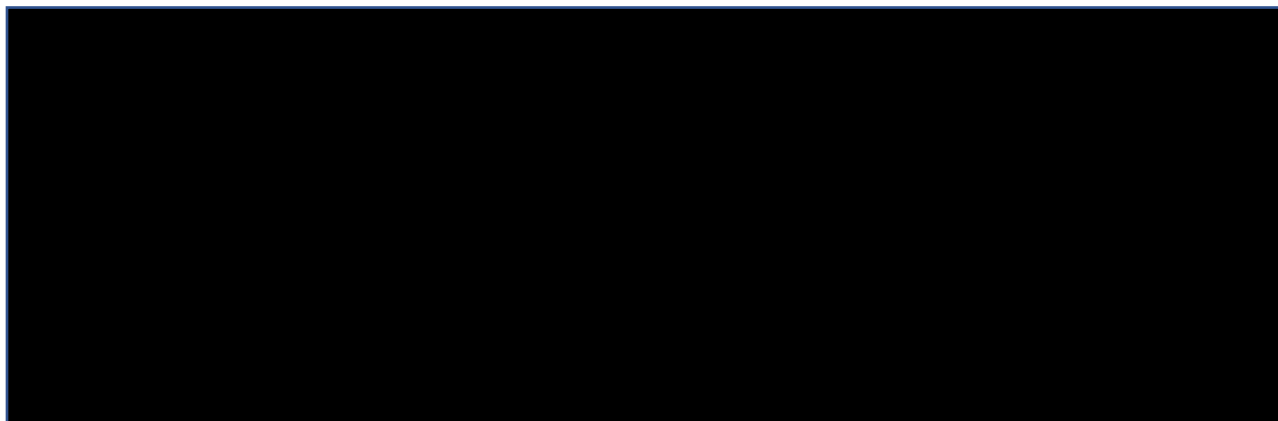
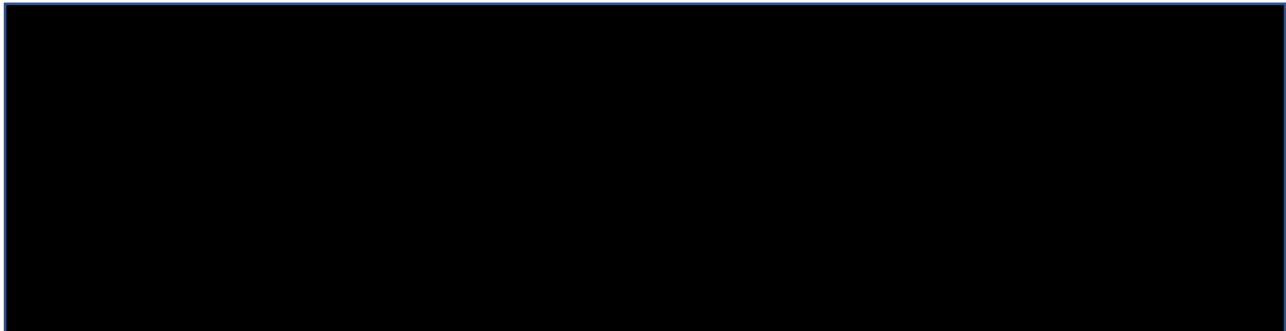July 19, 2018

Dear Ms. Backenstoe,

On behalf of the ████████████ Board of Education, I am granting you permission to contact members of our High School Teaching Staff via email to invite them to participate in your research study.
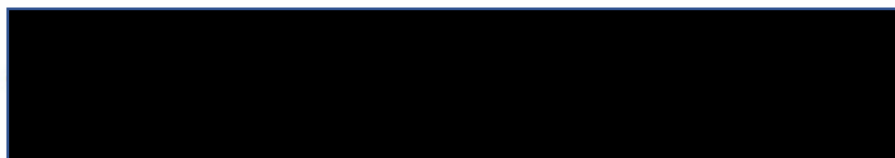
Sincerely,

Superintendent

Appendix L

July 2, 2018

Kelly Backenstoe

Dear Ms. Backenstoe,

I am granting your permission to contact members of our High School Teaching Staff via email to invite them to participate in your research study.
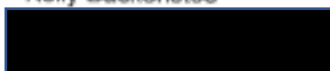
Sincerely,

Superintendent

DRK/imd

Appendix M

May 9, 2017

Kelly Backenstoe

Dear Ms. Backenstoe:

This letter grants permission to have our high school teachers be part of your research for your doctoral degree.

I understand that the high school teachers will be emailed an electronic link to the survey and that all data collected will be for research purposes only and that staff members' responses will remain anonymous.

Please contact me if you have any questions.

Sincerely,

Superintendent of School