2020

Peer-to-Peer E-Learning and Professional Practices of First-Year Teachers

Brian Keith Green
Walden University

Walden University

College of Education

This is to certify that the doctoral study by

Brian Keith Green

has been found to be complete and satisfactory in all respects,
and that any and all revisions required by
the review committee have been made.

Review Committee
Dr. Carla Lane-Johnson, Committee Chairperson, Education Faculty
Dr. Claribel Torres-Lugo, Committee Member, Education Faculty
Dr. Ioan Ionas, University Reviewer, Education Faculty

Chief Academic Officer and Provost
Sue Subocz, Ph.D.

Walden University
2020

Abstract

Peer-to-Peer E-Learning and Professional Practices of First-Year Teachers

by

Brian Keith Green

MA, University of Northern Colorado, 1995

BS, Bethany College, 1986

Doctoral Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Education

Educational Technology

Walden University

August 2020

Abstract

Students are at an academic disadvantage by having first-year teachers who lack the necessary professional practices and teaching skills. Education leaders need ways to improve professional practice deficits of first-year teachers to address the inequities professional practice deficiencies cause. The purpose of this quantitative, quasi-experimental study was to examine the professional practice differences of first-year teachers who participated in peer-to-peer e-learning to those who did not receive similar training. Participants of this study included first-year teachers (n = 28) who participated in peer-to-peer e-learning throughout their first year of teaching compared to a historical cohort of first-year teachers (n = 32) who did not participate in similar training. A Mann-Whitney U was used to analyze three sets of Teacher Quality Standard scores for each participant that focused on professional practices and skills. The peer-to-peer e-learning model was analyzed using the lens of transactional distance theory. Overall, the combined Teacher Quality Standard mean scores were higher (+5.04%), but not significantly so, for teachers who participated in peer-to-peer e-learning than for those who did not participate. Future researchers may wish to consider using larger samples for their studies. The findings from this study may be used by administrators to help in developing training for new teachers.

Peer-to-Peer E-Learning and Professional Practices of First-Year Teachers

by

Brian Keith Green

MA, University of Northern Colorado, 1995

BS, Bethany College, 1986

Doctoral Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Education

Educational Technology

Walden University

August 2020

Dedication

I dedicate this dissertation to my family. I owe a special thanks to my wife and best friend Avelyn Green and to my wonderful children Ryan, Brett, and Emily. I relied on your support throughout this process. I would not be where I am today without each of you, your patience, and your words of encouragement!

I also dedicate this dissertation to my parents who in my formative years constantly reminded me that no matter what you decide to do in life always strive to be your very best. Throughout my life I, too, have encouraged countless students, athletes, my children, and others do their very best. Writing this dissertation and completing this journey symbolizes my commitment to being the very best I can be academically.

Finally, I would like to dedicate this dissertation to all the students and athletes I have had the pleasure to teach and coach. Carrying on my family tradition, I challenged each of you to strive to be your very best. In return, your strength, perseverance, and pursuit of excellence ultimately inspired me to dig deep, stay true to my commitments, overcome adversity, and cross the doctoral finish line.

I hope that the completion of this dissertation shows you that with the right mindset, focus, motivation, and determination you can accomplish anything you set your mind to.

Acknowledgments

To my committee chair Dr. Carla Lane-Johnson, I am grateful for your wisdom, guidance, patience, and encouragement throughout this process. You were there each and every time I began to question my ability to get to the next stage of the doctoral journey. I consider it a privilege having had the guidance of a true pioneer in educational technology. It was an honor to be your mentee.

I would also like to thank my second committee member, Dr. Claribel Torres-Lugo for your guidance and support. Your words of encouragement went straight to my heart and inspired me work through the statistical analysis, especially when dealing with data challenges.

To my program director, Dr. Cheri Toledo, URR, Dr. Ioan Ionas, and all the Walden University faculty, thank you for thoughtful and meaningful feedback, sharing your collective wisdom, and for helping me reach the ultimate pinnacle of academic accomplishment.

Table of Contents

List of Tables

List of Figures

Chapter 1: Introduction to the Study

Every year school children are unwitting participants of a teacher lottery, which describes how little say students or their parents have in the teachers they receive from year to year. There is always the possibility that the teacher a student receives may not have professional practice proficiencies or teaching skills necessary to help the student maximize their achievement. Having unskilled and underprepared teachers negatively impacts student learning. A three-year study showed that students who had effective teachers have more than 2.5 times the gains in achievement compared to students who had ineffective teachers (Sanders, Wright, & Horn, 1997). New teachers, who have little teaching experience were also less effective and less skilled than experienced teachers (Grissom, Kalogrides, & Loeb, 2015; Kini & Podolsky, 2016). Despite the best efforts of preservice education programs preparing first-year teachers, new teachers entering the education workforce are lacking necessary teaching skills and professional practices (Goldring, Taie, & Riddles, 2014). The lack of teaching skills and professional practice has led to inequity in the quality of teachers that students receive from year to year (Grissom et al., 2015). Lack of teacher preparation adversely impacts student achievement (Helms-Lorentz, van de Grift, & Maulana, 2016). Students assigned an inexperienced first-year teacher, have less opportunity than their peers to learn and achieve. The imbalance in professional practice proficiencies and teaching skills of inexperienced teachers leads to an inequity in the quality of teachers that students received from year to year (Grissom et al., 2015).

The goal of this study was to determine if first-year teachers who participate in an innovative, year-long, embedded, continuous, peer-to-peer e-learning experience increase professional practices as measured by Teacher Quality Standard scores. Professional practices are educator skills considered necessary to be an effective teacher. If the peer-to-peer e-learning model is impactful, peer-to-peer e-learning may become a tool that school leaders could use to quickly, efficiently, and effectively improve their professional practices and teaching skills first-year teachers and increase the likelihood of placing more effective first-year teachers in classrooms. If peer-to-peer e-learning successfully improves teacher effectiveness, then receiving a first-year teacher will be less of an academic disadvantage. This study has the potential to make a positive social contribution of improving student achievement by increasing the professional practices and teaching skills of first-year teachers.

The major components of this study will be examined in Chapter 1. The major components of this study include problem statement, purpose, research questions and hypotheses, theoretical framework, nature of the study, definitions, assumptions, limitations, delimitations, and significance. Additional information on each research component will be explained in greater detail in the following four chapters.

Background

In this study, I focused on a gap in distance education literature around the use of a peer-to-peer e-learning model. There is a gap in research around online peer-to-peer e-learning designs for first-year teachers. The review of the literature did not find research that directly examined professional practice outcomes of first-year teachers who

participated in a peer-to-peer e-learning model. Researchers, however, were asking for investigations in this area to understand better how online instructional designs and transactional distance constructs impact student learning and student learning outcomes (Andrade, 2014; Dubuclet, Lou, & MacGregor, 2015; Ekwunife-Orakwue & Teng, 2014; Quong, Snider, & Early, 2018). In this study, gaps in distance education research were addressed by measuring and analyzing first-year teacher professional practice outcomes to determine the impact of a self-regulated, highly autonomous, peer-to-peer e-learning model.

This study was necessary to understand the differences in the professional practices of first-year teachers who participated in peer-to-peer e-learning. Understanding the impact of peer-to-peer e-learning design has the potential to inform future peer-driven or peer-led e-learning models for first-year teachers and other educators. This study may provide education leaders with new professional learning strategies to more quickly, efficiently, and effectively improve the professional practices of first-year teachers; thus, reducing the educational inequities inherent with inexperienced teachers.

Setting

The setting for this study is a large western U.S. metro-suburban school district. The school district is in a region with 17 other school districts that range from large inner-city schools to rural schools. Much of the district landmass is rural, but a majority of the students attend suburban schools in an area of the district that has experienced rapid urban sprawl over the past 15 years. Over a 5–year span

beginning in 2012, student growth was 36.5% for this district (State Department of Education, 2017). Between the 2015–2016 school year and the 2016–2017 school year, the participating school district hired 256 new teachers to fill teaching positions. The 256 new teachers represented a 24.7% change in new teachers to the school district (State Department of Education, 2017). The demand for so many new teachers in this school district can be attributed to the addition of new teaching positions added due to rapid student growth (State Department of Education, 2017) and to replace routine teacher turnover. Teacher turnover during this time was 16.24%, which was considered at the time, typical for large school districts in the State. This school district had averaged approximately 40 first-year teacher new hires since 2015–2016.

Problem Statement

The problem addressed in this study was the deficiency of professional practices and the teaching skills of first-year teachers. Education leaders are concerned with the preparedness of new teachers entering the education profession (Goldring et al., 2014). Despite the best efforts of preservice education programs, new teachers entering the education workforce lack necessary teaching skills and professional practices (Goldring et al., 2014), which leads to inequity in the quality of teachers that students received from year to year (Grissom et al., 2015). New teachers with 1 to 3 years of experience, have a 20% attrition rate (Goldring et al., 2014) and are much less skilled than experienced teachers. Lack of preparation negatively impacts student achievement because unskilled teachers have lower-achieving students (Helms-Lorentz et al., 2016). Solutions to more

quickly, efficiently, and effectively improve the teaching skills and professional practices of first-year teachers are needed in schools. School leaders are struggling with this problem because resources such as time, money, and space needed to provide adequate training that specifically focuses on developing professional practices of first-year teachers are lacking. The peer-to-peer e-learning model used in this study, which had no instructor and focused on critical professional practices, created an efficient, cost-effective e-learning opportunity for first-year teachers.

Results from recent studies indicate that peer-to-peer e-learning can improve educator skills and knowledge of prospective teachers (Bone & Edwards, 2015; Yang, 2016). Contrary to Bone and Edwards (2015) and Yang (2016), other researchers have doubts about the overall effectiveness of peer-to-peer influence on learning (Krutka, Carpenter, & Trust, 2016; Stigmar, 2016). Peer-to-peer e-learning, along with other related elements, continues to be an emerging field (Lynch, Cil, Lehane, Reardon, & Corrigan, 2014).

Moore (1972) observed and noted that autonomous learning was variable and that instructional programs could be designed or organized in ways to accommodate the autonomous learner (p. 81). The peer-to-peer e-learning model in this study had no teacher, which created a high degree of learner autonomy. The amount of structure needed in online course design is dependent on the level of learner autonomy, and the amount of transaction distance students are willing to tolerate (Moore & Diehl, 2019). Saba and Shearer (1994) found that there may be benefits in self-regulated, autonomous learner models, such as peer-to-peer e-learning, where the learner had more control in

dialog and decision making. The question addressed in this study was whether first-year teachers in an e-learning environment of peers that demand high learner autonomy could replace the need for an instructor, overcome a high degree of transactional distance, and learn from each other. To provide more clarity on the effectiveness of this peer-to-peer e-learning model, I investigated the difference in professional practices of first-year teachers trained in peer-to-peer e-learning to those who did not receive similar training.

Purpose of the Study

The purpose of this quantitative study was to determine if participating in peer-to-peer e-learning throughout a school year improves the professional practices and skills of first-year teachers as measured by Teacher Quality Standard scores. In this study, changes in professional practice were determined by analyzing the differences in the scores of three Teacher Quality Standards. The peer-to-peer e-learning outcomes and standards addressed in this training included classroom environment (Teacher Quality Standard II), effective instruction (Teacher Quality Standard III), and reflection on practice (Teacher Quality Standard IV). Teacher Quality Standards II, III, and IV were selected for this study because they aligned with the peer-to-peer e-learning outcomes and instructional design. Teacher Quality Standard I and V were not part of the instructional design, nor were they associated with the professional learning goals of the peer-to-peer e-learning program. Therefore, Teacher Quality Standard I and V were not included in this study.

I used a quasi-experimental design to analyze the differences in three Teacher Quality Standard scores of first-year teachers who participated in peer-to-peer e-learning

compared to a historical cohort of first-year teachers who did not receive similar training. The State Department of Education established the Teacher Quality Standards. These standards are observed and evaluated by building administrators throughout the school year and are used to measure and evaluate teachers' professional practice proficiency. Teacher evaluations result in professional practice proficiency scores for each Teacher Quality Standard.

In this study, my goal was to learn if this peer-to-peer e-learning design will have a significant impact on the professional practice scores of first-year teachers. The peer-to-peer e-learning model was an embedded, continuous, e-learning experience for first-year teachers to connect, improve professional practices on Teacher Quality Standards II, III, and IV, promote innovation in the classroom, and provide a means for first-year teachers to connect and learn from each other.

The independent variable in this study was the level of training (nominal data). The two levels of training were: (a) received peer-to-peer e-learning and (b) did not receive similar training. Teacher Quality Standard scores, which measure professional practice proficiency, were the dependent variables (continuous) in this study.

There are six Teacher Quality Standard scores (I-VI). The first five Teacher Quality Standard scores (I-V) measure professional practice proficiency (State Department of Education, n.d.). The score for Teacher Quality Standard VI is a measure of student learning outcomes. All six Teacher Quality Standard scores are combined in the State Model Evaluation tool by principals to determine the overall educator effectiveness. The focus of this study was specifically on professional

practices and teaching skills of first-year teachers for Teacher Quality Standard scores II, III, and IV. Teacher Quality Standard scores I, V, and VI were not relevant to this research and were not included.

Research Question and Hypotheses

A quantitative methodology was used to answer the research question. I analyzed the Teacher Quality Standard scores from routine teacher evaluations by building administrators who used the State Model Evaluation tool. The independent variable was the training level and the independent variables were the three Teacher Quality Standard scores (II, III, and IV). Teacher Quality Standards are measured using the State Model Evaluation instrument. Teacher Quality Standard scores of first-year teachers (2017–2018) who participated in peer-to-peer e-learning (experimental group) were compared to Teacher Quality Standard scores of first-year teachers (2016–2017) who did not receive similar training (control group) using a Mann-Whitney U test.

Research Question 1 (RQ1): What is the difference in three Teacher Quality Standard mean scores, as measured by the State Model Evaluation instrument, of first-year teachers trained in peer-to-peer e-learning to those who did not receive similar training?

Null Hypothesis ($H_0$1): There is no statistically significant difference in Teacher Quality Standard mean scores (i.e., classroom environment, effective instruction, and reflection on practice) between first-year teachers trained in peer-to-peer e-learning to those who did not receive similar training.

Alternative Hypothesis (H_a1): There is a statistically significant difference in Teacher Quality Standard mean scores (i.e., classroom environment, effective instruction, and reflection on practice) between first-year teachers trained in peer-to-peer e-learning to those who did not receive similar training.

Theoretical Foundation

Transactional distance theory was the theoretical foundation for this study. Transactional distance theory was used address the relationship between the online design variables of dialogue, structure, and learner autonomy to transactional distance (Moore & Kearsley, 2012). Michael G. Moore, a pioneer in distance learning, introduced this theory (Moore, 1973). While studying independent learning and learner autonomy, Moore (1973) recognized the need to consolidate the many forms of correspondence-type learning and independent learning into one category he called distance education. Moore (1973) believed that a new theory was needed for distance learning to examine the phenomenon that separates teachers and independent learners in that environment. Moore explained how the perceived gap between the learner and teacher was both physical and psychological and he explained that the psychological space required special pedagogical considerations (Moore, 1973). Moore explained that three *macrofactors* - dialog, structure, and autonomy—influenced this gap between the teacher and learner (Moore, 1973, p. 661). In 1980, the physical and psychological space explained in Moore's original theory of distance education was coined *transactional distance* (Boyd & Apps, 1980, p. 21). Moore's distance education theory (Moore, 1973) later incorporated the phrase transactional distance into *transactional distance theory*. Transactional

distance theory is the predominating theory used to guide and inform distance education designs.

I used transactional distance theory in this study to inform the original design of the peer-to-peer e-learning model. I also focused on the construct of learner autonomy, which is a primary tenant of transactional distance theory. The perceived gap between the teacher and the learner in distance learning is explained by transactional distance theory. Moore and Diehl (2019) explained that this gap called transactional distance was influenced by course structure, dialog, and learner autonomy as well as course interactions.

Moore (1972) considered distance teaching and learner autonomy the first and second dimensions of independent learning. Moore (1972) also observed and noted that autonomous learning was variable, which could range from *highly individualized* to *low individualized* (p. 79) and that instructional programs could be designed or organized in ways to accommodate the autonomous learner (p. 81). The peer-to-peer e-learning model in this study, which had no teacher, naturally created a situation that demanded high learner autonomy. The amount of structure needed in an online course depends on learner autonomy, and the amount of transaction distance students were willing to tolerate (Moore & Diehl, 2019). Saba and Shearer (1994) suggested there may be benefits in self-regulated, autonomous learner models, such as peer-to-peer e-learning, where the learner had more control in dialog and decision making. Saba and Shearer (1994), however, point out that "a desired instructional strategy" is one where there is a

balance between dialog and structure (p. 55). Details of transactional distance theory and other supporting theory areas will be discussed in Chapter 2.

Studies have shown that peer-to-peer e-learning can improve educator skills and knowledge of prospective teachers (Bone & Edwards, 2015; Yang, 2016). One unknown variable in this study was whether first-year teachers could tolerate the transactional distance created in a highly autonomous e-learning model. By analyzing the differences in Teacher Quality Standard scores between the control group and experimental group, I was able to determine if first-year teachers learn in a highly autonomous e-learning environment.

Nature of the Study

In this study, I used a quasi-experimental design to analyze archived data of three Teacher Quality Standard scores from a historical control group of first-year teachers (2016–2017) to the same three Teacher Quality Standard scores from an experimental group of first-year teachers (2017–2018). Quantitative research designs, such as this one, can be experimental, quasi-experimental, or non-experimental (Burkholder, Cox, & Crawford, 2016). While an experimental design provides the most valid results, an experimental design may not always be possible in the educational setting (Burkholder et al., 2016). Quasi-experimental designs can be used for educational settings when randomized experimental groups cannot be formed (Burkholder et al., 2016; Butin, 2010). A quasi-experimental research design is a pragmatic approach suited to finding practical solutions to complex problems situated in this educational setting (Burkholder et al., 2016).

Independent Variable. The independent variable for this study was the level of training, and these data were nominal. The experimental group comprised 28 first-year teachers (2017–2018) and received peer-to-peer e-learning training throughout the school year. The control group (historical), comprised 32 first-year teachers (2016–2017), who did not receive similar training. The 2016–2017 first-year teachers (control group) were a historical cohort control group, which is considered a viable option in education research (Walser, 2014).

Dependent Variable. The dependent variable in this study was Teacher Quality Standard scores. I analyzed three Teacher Quality Standard scores (II, III, and IV) that measured professional practices and teaching skills in the areas of the classroom environment, effective instruction, and reflection on practice. Teacher Quality Standard scores are continuous data. Teachers are evaluated every year against Teacher Quality Standards that measure professional practices and teaching skills. Teacher Quality Standard scores are the products of evaluator observations, artifacts, and work products collected and assessed throughout the school year. Teacher Quality Standard scores are recorded and measured by the State Model Evaluation instrument. In this study, building administrators, usually principals and assistant principals, were responsible for evaluation and data collection.

I originally planned to analyze the data using ANOVA; however, I changed my approach. An ANOVA is used to analyze statistical differences between Teacher Quality Standard scores of the experimental group and the control group. However, after discovering that Teacher Quality Standard scores were not normally distributed and could

not meet the assumptions of normality and outlier data, I used the Mann-Whitney U test, a nonparametric analysis, to answer the research question.

Definitions

The terms and definitions below explain and describe educational concepts specific to the State Model Evaluation, study variables, e-learning, and transactional distance theory. The independent variable (training level) included first-year teachers who received peer-to-peer e-learning and first-year teachers who did not receive similar training. The dependent variables are Teacher Quality Standard scores. Evaluators use the State Model Evaluation instrument to collect these data. E-learning gives meaning to a distance education term that was often used interchangeably with similar terms, such as distance learning, web-based learning, and online learning. Transactional distance theory is often used to explain, understand, and inform e-learning course design. E-learning often uses transactional distance theory to explain and understand course design.

Educator effectiveness: This is a measure of an educator's professional practices that improve student outcomes relative to what would have been evident without any intervention (State Department of Education, 2015, p. 145).

E-learning. The use of electronic applications to enable the transfer of skills and knowledge (Gautam & Tiwari, 2016, p. 1). Gautam and Tiwari (2016) identified five basic components of e-learning: (a) course structure, (b) usability, (c) audience, (d) page design, and (e) content engagement. Similarly, Clark and Mayer (2011) defined e-

learning as synchronous or asynchronous instruction delivered on a digital device to support learning to build knowledge and skills (p. 8-9).

Professional Practices: State Department of Education (2015) defines professional practices as "The day-to-day activities in which educators engage as they go about their daily work. These are the behaviors, skills, knowledge, and dispositions that educators should exhibit" (State Department of Education, 2015, p. 154). For evaluation, professional practices were aligned to Teacher Quality Standards one through five.

Teacher Quality Standards: "The professional practice or focus on student academic growth needed to achieve effectiveness as a teacher" (State Department of Education, 2015, p. 157). The State Department of Education (2015) uses five Teacher Quality Standards to evaluate educator effectiveness. Standards are subdivided into twenty-seven elements. The elements are evaluated separately, then aggregated to form the Teacher Quality Standard score for a standard. There was one aggregate score for each of the five Teacher Quality Standards (see Appendix C).

Transactional Distance Theory. Transactional distance theory addresses the relationship between the distance learning design variables of dialogue and structure as well as learner autonomy (Moore & Kearsley, 2012), as each generally relates to distance education and specifically to transactional distance.

Assumptions

Participation in the district induction program was voluntary. I assumed that first-year teachers were motivated to participate in peer-to-peer e-learning and pursue course work with fidelity. Similarly, I assumed that education leaders were consistent in their

evaluations of first-year teachers across the school district. The State Department of Education required school districts to provide evaluator training to all evaluators to increase the reliability of results across the organization. The school district participating in this study provided this training across the organization. My final assumption was that first-year teachers would tolerate the high levels of learner autonomy demands in a peer-to-peer e-learning environment. The learner autonomy assumption was significant because for learning to occur in a peer-to-peer e-learning model with high transactional distance, independent learners such as first-year teachers must accept higher learner autonomy responsibilities.

Scope and Delimitations

The problem addressed in this study was the deficiency of professional practices and teaching skills of first-year teachers. Inequities in teacher quality can result when students receive under-skilled first-year teachers. First-year teachers often lack necessary teaching skills and professional practices, which can lead to lower student achievement (Helms-Lorentz et al., 2016) and create inequities in the quality of teachers that students receive (Grissom et al., 2015). A peer-to-peer e-learning model was designed and implemented in 2017–2018 to address the lack of first-year teachers' professional practices. This training was a new requirement added to the district-sponsored induction program. Peer-to-peer e-learning was an innovative, embedded, continuous, professional learning design that allowed first-year teachers to connect and learn from other first-year teachers. The participating school district designed peer-to-peer e-learning to more quickly, efficiently, and effectively improve the professional

practices of first-year teachers. This intervention used no direct instruction and required participants to spend little time outside the classroom. Participants in peer-to-peer e-learning researched new teaching strategies around three Teacher Quality Standards, applied the strategies in their classrooms, reported their findings to the cohort, and shared their learning experiences with peer cohorts. Additional intervention details are explained in Chapter 3.

The design of the peer-to-peer e-learning model was a collaborative effort. The model was designed in 2016–2017 by a steering committee comprised of education leaders and practitioners. Implementation of the peer-to-peer e-learning occurred in the fall of 2017–2018. The steering committee helped choose peer-to-peer e-learning model used in this study. Participants in this study were provided an embedded, continuous, e-learning experience to connect with other first-year teachers, to improve professional practices on Teacher Quality Standards II, III, and IV, promote innovation in the classroom, and provide a means for first-year teachers to learn from each other.

The sample frame for this study included all first-year teachers in 2016–2017 and all first-year teachers in 2017–2018 in the participating school district. The experimental group included all 2017–2018 (n = 28) first-year teachers who completed online peer-to-peer training and had recorded Teacher Quality Standard scores. The control group (historical) included all 2016–2017 first-year teachers (n = 32) who completed online peer-to-peer training and had recorded Teacher Quality Standard scores. The historical control group did not receive similar training to the experimental group. A historical

control group was used in this study because it was not feasible, practical, or ethical to use an experimental control group. A historical cohort model is considered a viable option for education research (Walser, 2014). First-year teachers had the option not to participate in the district-sponsored induction program. Some first-year teachers in the experimental group did not complete induction (n = 4).

According to the central limit theorem, researchers can assume that the sampling distribution would be approximately normal in sampling sizes greater or equal to 30 participants (Frankfort-Nachmias & Leon-Guerrero, 2015). In this study, a 100% sample frame reflected the characteristics of the entire first-year teacher population, and at or near 30 participants in each group suggested that sampling distribution had a chance of being approximately normal. Considering the sample sizes were small (n = 28 & n = 32), the Shapiro-Wilk test was run to determine if data were distributed normally. As a result of the Shapiro-Wilk results, the assumption of normality for an ANOVA was not met for any of the dependent data sets, meaning ANOVA results would not be reliable. A nonparametric analysis (Mann-Whitney U) replaced the ANOVA. All four assumptions required of the Mann-Whitney U test were met.

Generalizability is the degree to which a quantitative study's findings will hold across other, broader contexts (Burkholder et al., 2016). Generalizability could be expanded to a more diverse population if a large enough random sample of that population was used (Burkholder et al., 2016). However, this study only included first-year teachers who were in year one of a two-year district-sponsored induction program. The results of this study may be generalizable to other first-year teachers

who participate in Year 1 of an induction program in similar rural-suburban school districts. Controlling for sampling frame and research design strengthens generalizability (Babbie, 2017), especially for a subset of other first-year teachers. However, results would likely not be considered generalizable to different population subsets outside of first-year teachers and geographic boundaries. The likelihood of generalizability is not high, given the small sample size and overall low power for this study.

Limitations

While researchers strive to account for and limit the variables that could influence study findings, for this education-based research, it was impossible to control for most variables. The inability to control for most variables places many limitations on the results of this study. Limitations associated with any study can threaten the overall validity of the research. The probable threats to research validity, internal validity, external validity, construct validity, statistical validity, and experimenter bias for this study will be briefly described in the following section.

Internal Validity. Internal validity is explained by how closely measurements collected in a study reflect target the intended metric (Heale & Twycross, 2015; Lambert, 2012). Suter (2011) described internal validity as the degree to which a research design controls research bias and other forms of "contaminating influences" (p. 196). Foreseeable threats to internal validity for this study include the use of a secondary data source, sample selection and size, confounding variables such as additional professional development taken, quality of

mentoring, quality of instructional coaching, first-year teacher's relationship with school leadership, and other new programs implemented this year at various schools (Babbie, 2017).

The study limitations occurred for various reasons. First, teachers were free to choose additional professional development and training, above and beyond standard requirements for inductees. Historically, the level of participation in additional professional development varied among first-year teachers. Schools across the participating district also offered in-service training throughout the school year that varied in scope, focus, duration, and quality. Secondly, the interactions with other educators and the quality of leadership, as well as the degree of leadership influence, may have contributed to professional practice differences of first-year teachers. Additionally, all first-year teachers were paired with lead mentors and mentors, but there was inconsistency in the quality of mentoring received. Finally, another confounding factor was interactions with instructional coaches. Not all mentees had access to or interaction with instructional coaches. The presence and availability of instructional coaches varied from school to school. The quality of the mentorship and instructional coaching also varied considerably across the participating district. Participating in peer-to-peer e-learning ensured that there was a shared focus on professional learning targets, regardless of the quality and level of mentor support and instructional coaching.

External Validity. External validity is the ability to generalize the findings of a study to others in the "real world" (Babbie, 2017, p. 245). External validity,

also known as generalizability, is the degree to which the findings of a quantitative study would hold across other, broader contexts (Burkholder et al., 2016, p. 117). The results within a controlled social experiment do not necessarily reflect how the same treatment and conditions would affect others (Babbie, 2017). The possible threats to external validity in this study include sampling bias, setting, and research design. A quasi-experimental design was used to address the research design and selection bias threats to external validity. The quasi-experimental design is an approach used when participants cannot be selected randomly, and when using an experimental design may cause harm (Burkholder et al., 2016). Since this study used archival data, and the event had already occurred, random selection for the sampling frame was not possible. Non-random selection of participants could lead to a sampling that was "not typical or representative of the larger population" (Babbie, 2017, p. 200). This study included all first-year teachers in the sampling frame. The inability to control for sample size and small sample sizes weakened the case for generalizability (Burkholder et al., 2016).

Setting. The setting of a study affects external validity and reduces the ability for results to be generalizable. Due to the nature of this ex post facto study, participants were unaware that they were part of a research study. Participants could have behaved differently and the results could have been skewed either positively or negatively, if first-year teachers knew they were participating in a study. Similarly, placing participants in environments or under conditions that were not normal to them could skew results. Participants not knowing they were in a study improved the

external validity of this study. Frey (2018) suggested that researchers engage participants in studies in ways similar to the real world. Participants in this study were engaged in real-time professional learning, unaware they would be part of a study. These conditions reduced, if not eliminated, setting threats to external validity.

Construct Validity. Construct validity is the ability of an instrument to measure intended qualities (Babbie, 2017). The focus of this study was on the impact of peer-to-peer e-learning on the professional practices of first-year teachers to first-year teachers who did not participate in peer-to-peer e-learning. Professional practices were measured using the State Evaluation Model. The State Evaluation Model was used to measure 27 professional practices within five Teacher Quality Standards. The combination of evaluator observations, artifacts, and work products produce the Teacher Quality Standard scores. The State Evaluation Model for teachers, which has been in implementation since 2013, was developed by The State Department of Education. With a high internal consistency (Chronbach's Alpha = 0.94), the State Model Evaluation instrument is considered to have excellent reliability.

Evaluators participate in training each year on the uniform application of the State Evaluation Model. Regardless of this training, there is always the possibility of inconsistent application of the State Evaluation Model by evaluators. The misapplication of the State Evaluation Model could impact the findings of the study.

Statistical Conclusion Validity. Statistical conclusion validity is the accuracy and reliability of analytical results from a study. Threats to statistical

conclusion validity for this study were sample size and interpretation of findings errors.

All first-year teachers were included in the sample frame, which netted 32 control group participants and 28 experimental group participants. This sample size is insufficient for statistical reliability, even though it included all first-year teachers. Generally, a sample size of 50 or more will produce an approximately normal mean distribution (Babbie, 2017). However, Babbie (2017) stated, "We can assume that the sampling distribution will be normal even with samples as small as 30 if we know that the population distribution approximates normality" (Babbie, 2017, p. 227). There is a chance that the small sample size will produce an approximately normal mean distribution, considering that the sample included all first-year teachers from a large school district, and the number of participants in each group was near or above 30.

Two errors can occur during the statistical analysis of the data, which could threaten statistical conclusion analysis. A type one error can occur if there are incorrect conclusions about the relationship between two variables that leads to the rejection of a true null hypothesis when there was no relationship between the two variables (Frankfort-Nachmias & Leon-Guerrero, 2015, p. 277; Validity-Statistics Solutions, 2017). "A type two error can occur when a false null hypothesis has failed to be rejected" (Frankfort-Nachmias & Leon-Guerrero, 2015, p. 277; Validity-Statistics Solutions, 2017).

When conducting a study, researchers must contend with numerous sources of biases (Suter, 2011). Babbie (2017) defined bias as "the quality of a measurement device that tends to result in a misrepresentation, in a particular direction, of what is being measured" (p. 260). Biases, both intentional and unintentional, can occur in research. Another type of bias is called experimenter expectancy bias or expectancy effect. The expectancy effect, sometimes referred to as the Pygmalion Effect, results from conditions created that persuade study outcome results due to researcher expectations (Suter, 2011). Regardless of the types of biases that exist, it is incumbent upon the researcher to anticipate and control for all kinds of bias contamination that could somehow influence the results of a study. I addressed biases by examining and explaining internal and external validity, such as selection bias, experimental design, instrumentation, statistical interpretation errors, extraneous events, outside influences, and more.

Significance

This study has the potential to make a positive social contribution of improving student achievement and student outcomes by addressing teacher quality inequities that result from receiving ineffective and ill-equipped first-year teachers. The deficiency of professional skills can harm student learning (Helms-Lorentz et al., 2016). Education leaders must have the means necessary to effectively and efficiently improve professional practices of new, inexperienced, first-year teachers. Improving first-year teacher professional practices can lead to more effective and higher-skilled teachers, making learning opportunities for all students more equitable despite first-year teacher inexperience. The findings from this study may help education leaders understand if

peer-to-peer e-learning is a feasible solution to quickly, effectively, and efficiently improving professional practices of first-year teachers. Improving first-year teacher professional practices and teaching skills more quickly would increase student achievement and student outcomes, while simultaneously reducing the current inequities that existed in the education system.

Summary

In Chapter 1, the following major components of this study were examined: problem statement, purpose, research question, hypotheses, theoretical framework, definitions, assumptions, limitations, delimitations, and significance. The point of this study was to determine if peer-to-peer e-learning is a possible solution to the deficiency of professional practices and teaching skills of first-year teachers. A solution to this problem may improve student achievement by addressing student learning inequities related to unskilled first-year teachers entering the teaching workforce. This study is a quantitative, quasi-experimental analysis of archival data. The reason I conducted this study was to determine if participating in peer-to-peer e-learning throughout a school year improves the professional practices and skills of first-year teachers as measured by Teacher Quality Standard scores. The gap in distance education literature that is addressed in this study is the impact of a highly autonomous e-learning model on the professional practices and teaching skills of first-year teachers. Factors impacting research validity were explained, and efforts to minimize these validity concerns were considered throughout the study. The findings from this study have the potential to

positively impact student achievement by providing all students with teachers who have increased professional practices, despite teacher inexperience.

The theoretical framework and literature review will be discussed in Chapter 2. The theoretical framework for this study is transactional distance theory, and the literature review includes research in the theory areas of peer-to-peer learning, first-year teachers, teacher evaluation, and transactional distance theory constructs.

Chapter 2: Literature Review

The problem addressed in this study was the deficiency of professional practices and the teaching skills of first-year teachers. Despite the efforts of preservice education programs to prepare first-year teachers, new teachers entering the education workforce lack teaching skills and professional practices (Goldring et al., 2014). Unskilled educators have caused inequity in the quality of teachers that students receive from year to year (Grissom et al., 2015). New teachers, with 1 to 3 years of experience, had a 20% attrition rate and were less skilled than experienced teachers (Goldring et al., 2014). This lack of preparation harms student achievement because unskilled teachers have lower-achieving students (Helms-Lorentz et al., 2016). In addition to what mentoring programs already provide, schools need new solutions to more quickly and efficiently improve professional skills and professional practices of first-year teachers. More of the same type of professional development does not seem to be the solution to this problem (Jacob & McGovern, 2015).

Professional development is considered a process critical in the preparation and development of teachers (Guskey, 2009; Kennedy, 2016). The 2015 Mirage Report, however, found that despite vast resources invested in professional development, there was little impact on teacher growth and educator effectiveness (Jacob & McGovern, 2015). The findings from the Mirage Report suggest that education leaders need to develop innovative, embedded, continuous professional development models instead of relying on current professional development practices (Jacob & McGovern, 2015). The lack of teacher growth and educator effectiveness may be due to factors such as

professional development not being timely, relevant, meaningful, self-selected, or transformative; all fundamental principles of adult learning (Knowles, Holton, & Swanson, 2014). Peer-to-peer e-learning, an innovative, embedded, continuous e-learning model, was designed by the participating school district to incorporate fundamental principles of adult learning (Knowles et al., 2014). Peer-to-peer e-learning was also designed to include peer-to-peer interactions to overcome transactional distance, and peer-to-peer cohort learning to help first-year teachers build firm foundations of instructional and professional practice. In the future, school districts may need innovative professional learning designs such as peer-to-peer e-learning to deliver timely, efficient, and effective professional development, given growing budget constraints as well as increasing training demands. A peer-to-peer e-learning model, which had no instructor, was used to focus on critical professional practices by providing a timely and efficient professional learning opportunity for first-year teachers. What was not known was whether this e-learning model would be impactful.

Participating in peer-to-peer e-learning can improve educator skills and professional knowledge of prospective teachers (Bone & Edwards, 2015; Yang, 2016). However, the overall effectiveness of peer-to-peer influence on learning is questionable (Krutka et al., 2016; Stigmar, 2016). Peer-to-peer e-learning, along with other related elements, is still an emerging field (Lynch et al., 2014). There continues to be much to learn about the differences in professional practices of first-year teachers who participate in peer-to-peer e-learning for those who do not participate in peer-to-peer e-learning.

Perhaps studies like this one could provide some answers to address the deficiencies in the professional practices and teaching skills of first-year teachers.

Participating in peer-to-peer e-learning communities can significantly increase the professional growth of prospective teachers (Yang, 2016). Although researchers have conducted many peer-to-peer studies, at the time of this study, there was no research evaluating how peer-to-peer e-learning communities impact the growth of professional practices of first-year teachers. There was no teacher in this peer-to-peer e-learning model. Having no teacher in the e-learning platform created a unique learning experience where the participants were required to take on some of the teaching responsibilities. Research shows that the relationship between the teacher and learner is meaningful in e-learning (Dockter, 2016; Moore & Diehl, 2019). I used transactional distance theory as the lens to analyze this peer-to-peer e-learning model. According to transactional distance theory, an e-learning model with a relatively high transactional distance between teacher and learner requires greater student autonomy in the learning process (Moore & Kearsley, 2012). What was not evident before this study was the effect of this peer-to-peer e-learning model on the professional practice scores of first-year teachers and whether this e-learning design can overcome the burden of high transactional distance and high learner autonomy.

The purpose of this quasi-experimental study was to determine if there was a difference between the professional practices of first-year teachers trained with this peer-to-peer e-learning design to those not trained in peer-to-peer e-learning. I compared and analyzed Teacher Quality Standard scores to determine if there were significant

differences between the control group and experimental group scores. The professional practices addressed in this study were classroom environment, effective instruction, and reflection on practice. These professional practices were found in three Teacher Quality Standards. The professional practices in these three standard areas were professional learning, strategic priorities for all first-year teachers in the participating school district. I analyzed the differences in Teacher Quality Standard II, III, and IV scores (see Appendix C), which measure professional practices. Teacher Quality Standards, which were established by the State Department of Education, were observed, evaluated, and scored by administrators throughout the school year. The scores become a measure of professional practice proficiency. I conducted this study to learn if first-year teachers who participated in peer-to-peer e-learning had significantly different professional practice scores compared to a historical cohort of first-year teachers who did not participate in e-learning.

Chapter 2 includes the literature search strategy, the conceptual framework, and the literature review. Transactional distance theory is the theoretical framework through which the peer-to-peer e-learning design was analyzed. The other concepts I examined in the literature review included peer-to-peer learning, first-year teachers, teacher evaluation, and transactional distance theory.

Literature Search Strategy

I used these concepts to examine recent literature: transactional distance theory, peer-to-peer learning, first-year teachers, and measuring educator effectiveness. I searched the following databases: Science Direct, ERIC, SAGE Journals, Education

Source, ProQuest, Taylor & Francis, SAGE Research Methods, and to a lesser degree, Google Scholar. The following key terms were included in my literature review search: *novice teachers, beginning teachers, first-year teachers, peer learning, peer-assisted learning, peer-to-peer learning, peer e-learning, peer-led learning, team-based learning, transactional distance theory, dialogue, learner autonomy, teacher evaluation, distance education, educator effectiveness,* and *teacher performance*. I also included seminal work and studies related to transactional distance theory to understand the history and timeline of this theory area more deeply.

Theoretical Foundation

The concept of distance education is relatively new in the realm of education. Michael G. Moore, a pioneer in distance learning, while studying independent learning and learner autonomy, recognized that all forms of instruction could be dichotomized as either "contiguous teaching" a traditional face-to-face format, or "distance teaching" (Moore, 1972, p. 76). Moore (1972) defined distance teaching as "the family of instructional methods in which the teaching behaviors are executed apart from the learning behaviors…." (p. 76). Moore (1972) considered distance teaching and learner autonomy the first and second dimensions of independent learning. Moore (1972) also observed and noted that autonomous learning was variable, which could range from "highly individualized" to "low individualized" (p. 79) and that instructional programs could be designed or organized in ways to accommodate the autonomous learner (p. 81). The concepts of learner autonomy and distance teaching quickly grew into a theory of distance education.

In 1973, Moore (1973) introduced the concept of distance education and described distance education as the "interplay between people," connected for learning and separated from each other (Moore & Kearsley, 2011, p. 209). At the World Conference of the International Council for Correspondence Education (ICCE), Moore (1973) introduced the concept of distance education as a theoretical model that operationalized the distance between learners and teachers as a variable. Moore (1973) implied that distance was not only physical but also psychological, which required special pedagogical considerations (Moore, 1973). Moore (1973) explained the need to combine many forms of correspondence-type learning and independent learning into one category he called distance education. The first distance education theory was a heuristic device to better understand independent learning and to provide an ideal platform for this unique type of teaching and learning (Moore, 1973). Moore (1973) believed that for future independent learning research to be possible, a theoretical framework was needed to examine the phenomenon that separates teachers and learners in distance learning. Approximately 8 years later, in 1980, the physical and psychological space explained in Moore's original distance education theory was coined "transactional distance" (Boyd & Apps, 1980, p. 21). Moore's *distance education theory* was renamed *transactional distance theory*.

Moore explained how transactional distance, the perceived gap between the learner and teacher, was influenced by three *macrofactors* (Moore, 1973), which included: dialog, structure, and autonomy. Moore (1980) explained how transactional distance was a function of two variables, dialog and structure, that could be managed in

distance learning course designs. Moore (1983) described dialog as the extent to which learners and teachers were able to respond to each other and structure as an education program's ability to respond to the learner's needs. The relationship between dialogue and structure, as well as learner autonomy, is addressed by transactional distance theory (Moore & Kearsley, 2012). Each of these macrofactors impacts transactional distance.

Many other researchers have been testing and studying transactional distance theory for more than 3 decades. Saba and Shearer (1994) led one of the most informative studies around transactional distance. Saba and Shearer (1994) were interested in verifying the critical concepts of transactional distance theory using a dynamic model of distance education. Their work became foundational. Saba and Shearer (1994) explained that up to this point in time, most studies were descriptive, and only a few were data-based, focusing on achievement and cost benefits. The primary goal of Saba and Shearer's (1994) study was to "empirically verify the concepts of transactional distance, structure, and dialog" (p. 36). Saba and Shearer (1994) used the Systems Dynamics Model and discourse analysis between 30 students and one teacher in an educational technology master's degree program to analyze the relationship among transactional distance, dialog, and course structure. As a result of this study (Saba & Shearer, 1994), the tenets of transactional distance theory that transactional distance varied with dialog and structure were reinforced. Saba and Shearer (1994) also observed that when the learner controlled the rate of dialog, there was a lower perceived transactional distance. The more a teacher controls dialog, the higher the perceived transactional distance. Saba and Shearer (1994) found there may be benefits in self-regulated, autonomous learner

models, such as peer-to-peer e-learning, where the learner had more control in dialog and decision making. Saba and Shearer (1994), however, point out that "a desired instructional strategy" was one where there was a balance between dialog and structure (p. 55).

Not all researchers support the propositions and constructs of transactional distance theory. Gorsky and Caspi (2005) and Paul, Swart, Zhang, and MacLeod (2015) doubt whether transactional distance theory is a theory. Following an analysis of transactional distance theory, Gorsky and Caspi (2005) concluded that there was not enough empirical data to support this theory's fundamental propositions. Gorsky and Caspi (2005) also point out that the existing research data only partially supported this theory, and most studies lack reliability and validity. Moreover, Gorsky and Caspi (2005) described this theory as a tautology because dialog and structure were redundant variables. While revisiting Zhang's scale of transactional distance, Paul et al. (2015) pointed to the need to reconsider transactional distance theory to reflect advances in technologies that allow "for students to interact vicariously rather than actively" (p. 376). Paul et al. (2015) continued to stress the importance of transactional distance theory. They suggested that understanding and measuring transactional distance should be updated with educational technology changes over time. Another factor in distance education that changes over time was learner autonomy.

Learner autonomy, a key element in this study, is used to explain the teacher-learner relationship and how the learner ultimately decides the extent of this relationship (Dockter, 2016; Moore & Kearsley, 2012). The assumption that learner autonomy must

increase in an e-learning design where the transactional distance between the teacher and learner increases are the underpinnings of transactional distance theory. Moore and Diehl (2019) explained that more autonomous learners could overcome transactional distance. The learner-teacher relationship was a vital online learning consideration. Recent studies had shown that the relationship between the teacher and learner could be an essential factor in learning, especially in e-learning (Dockter, 2016; Moore & Diehl, 2019). In the peer-to-peer e-learning model for this study, where there was no instructor, there was the assumption that first-year teacher peers would serve a dual role as both the student and teacher. Thus, creating a learning environment that reduced the impacts of transactional distance while propagating higher degrees of learner autonomy. Learners were different in many ways, and not all learners had the same learner autonomy capacity. The amount of learner autonomy an online student has determines their ultimate success. There was an inverse relationship between the degree of learner autonomy and the amount of transactional distance tolerated (Huang, Chandra, DePaolo, Cribbs, & Simmons, 2015; Moore & Diehl, 2019; Moore & Kearsley, 2011). Autonomous learners tolerate a considerable amount more of transactional distance, while a nonautonomous learner tolerates less transactional distance (Huang et al., 2015; Moore & Diehl, 2019). How online course designs impact the levels of teacher behaviors and learner behaviors are explained using transactional distance theory. The phenomenological gap resulting from the transactional distance between the teacher and learner varied and increased or decreased by adjusting teaching behaviors such as course structure and dialog (Moore & Diehl, 2019). There were numerous structure and dialog variations that influenced

learner autonomy requirements, thus changing the teaching and learning experience. Because online learning can be "more distant" or "less distant" (Moore & Kearsley, 2011, p. 209), the online course designer must consider the tolerable amount of transactional distance.

Transactional distance theory has been used as the theoretical framework for many studies over the past five years. Researchers have been studying this theory by looking directly at the constructs of dialog, structure, autonomy, transactional distance, and subconstructs, such as interactions between teachers, learners, content, and system interface. Transactional distance theory has been used by previous studies to understand peer-to-peer learning better. Peer-to-peer e-learning and related constructs, however, are still an emerging field (Lynch et al., 2014), and there may be reasons to be hopeful for this type of learning. Yang (2016) and Bone and Edwards (2015) have shown that peer-to-peer e-learning can improve educator skills and knowledge of prospective teachers. In a qualitative study, Yang (2016) looked at the community of inquiry framework to examine how 14 preservice teachers interact and learn in online discussions (dialog). Preservice teachers playing the role of subject matter experts in an online feedback role increased their professional knowledge and cognitive presence (Yang, 2016). The same may occur when first-year teachers who serve as subject matter experts create teacher presence and increase their professional practices and increase professional practices of their first-year teacher peers.

Not all researchers agree on the concept of peer-to-peer learning. Following a metanalysis, Stigmar (2016) questioned the overall effectiveness of peer-to-peer

influence on learning outcomes, achievement, and more profound learning gains by peer participants of higher education. Krutka et al. (2016) suggested that more research is needed, which focused on the many factors of professional learning networks that impact deeper and continuous learning. Central to this study was whether first-year teachers in a peer-to-peer e-learning model demonstrate higher professional practice scores compared to a cohort group with no such training.

Researchers are asking for more research on peer-to-peer online learning. They are also asking for research on measuring efficacy and learning outcomes, rather than the heavy focus that is currently on learner perceptions. Similarly, Andrade (2014) suggested that researchers study the efficacy of self-regulated distance learning (Andrade, 2014). Several researchers were also asking for new research to understand better how instructional design and transactional distance constructs impact student learning and student learning outcomes (Andrade, 2014; Dubuclet et al., 2015; Ekwunife-Orakwue & Teng, 2014; Quong et al., 2018). Ekwunife-Orakwue and Teng (2014) suggested that researchers move away from just measuring learning perceptions and move towards measuring actual cognitive impacts as well as effective outcomes. Paul et al. (2015), who questioned whether the transactional distance theory was a theory, suggested that researchers study online course designs that examine transactional distance theory sub-constructs such as learner-learner interaction, teacher-learner interaction, and learner-content interaction on student achievement.

At the time of this study, little research was available on peer-to-peer online learning that used teacher participants and no research was discovered that used first-year

teachers. There continues to be much to learn about the effects of this type of e-learning model on the professional practice outcomes of first-year teachers. Central to this study is whether professional practice outcomes of first-year teachers increase, decrease, or remain the same in a highly autonomous, self-regulated, peer-to-peer e-learning model with no instructor. This study attempts to contribute to the current body of knowledge by understanding better the impact of professional practice outcomes of first-year teachers trained in a highly autonomous, self-regulated, peer-to-peer e-learning model.

Other theories I considered for this study included connectivity theory, community of inquiry theory, community of practice theory, and experiential learning theory. Ultimately, I chose transactional distance theory as the lens by which to understand and explain how first-year teachers learn in a peer-to-peer e-learning design with high learner autonomy demands. Online course designers predominantly use transactional distance theory to inform distance education designs such as peer-to-peer e-learning.

Literature Review

Peer-to-Peer Learning

Peer-to-peer e-learning can improve educator skills and increase knowledge of prospective teachers (Bone & Edwards, 2015; Yang, 2016). However, not all researchers agree on the overall impact of peer-to-peer influence on learning (Stigmar, 2016). Peer-to-peer e-learning, along with other related elements, is still an emerging field (Lynch et al., 2014). There continues to be much to learn about the differences in professional

practices of first-year teachers who participated in peer-to-peer e-learning to those who did not receive similar training.

Numerous peer learning models and titles are used to name, describe, and classify peer learning. The following were titles of various peer learning models found in academic literature:

- Peer Group Mentoring
- Peer Learning
- Peer-to-Peer Learning
- Peer-Led Team Learning
- Team-Based Learning
- Peer Assisted Learning
- Peer-Facilitated Learning
- Peer Learning Network
- Peer-to-Peer Professional Development Network
- Peer-to-Peer Teaching

During this literature review, I explored more than 20 peer-to-peer related studies to see what researchers were studying and discovering in this theory area. Some aspect of online peer-to-peer learning and a similar number of studies examined face-to-face peer-to-peer learning was found in over 10 studies. Not included in this literature review were professional learning network studies that did not specifically focus on peer-to-peer learning. Most of the peer-to-peer studies in this literature review used college student participants in the research, and very few peer-learning studies used teacher participants.

Although the average age difference between college students and first-year teachers is similar, the focus, experiences, and perspectives of the two groups may differ. Therefore, research with college student participants may not be generalizable or transferable to first-year teachers.

Traditional Peer-to-Peer Learning. Standard, face-to-face, peer-to-peer learning has been a long-running tradition in education, but researchers continue to understand the impacts of peer-to-peer learning better. A variety of peer-to-peer learning models are known to have a positive impact on student learning and psychological well-being. Hanson, Trolian, Paulsen, and Pascarella (2016) found peer-to-peer learning to be an "important pedagogical practice" (p. 191). In a meta-analysis study, Swanson, McCulley, Osman, Scammacca Lewis, and Solis (2017) discovered that team-based learning had a moderate impact on content knowledge, which was a higher impact than traditional methods. Swanson et al. (2017) also revealed that group size had a moderating effect on student outcomes – smaller groups performed better than larger groups. Swanson et al. (2017) and his team were not alone in finding a relationship between peer-to-peer learning and achievement.

Peer-to-peer learning can lead to an increase in knowledge and achievement. Following a meta-analysis study, Swanson et al. (2017) reported that peer-to-peer learning, in the form of team learning, had an effect size of 0.55, indicating a moderate impact on content knowledge acquisition. Other researchers discovered similar results. In a quantitative study that included 2074 first-year college students, Dancer, Morrison, and Tarr (2015) found that peer-assisted study sessions had a significant impact on

achievement, as evidenced by student grades. Dancer et al. (2015) and van der Meer, Wass, Scott, and Kokaua (2017) revealed a positive relationship between peer-assisted study session participation and grades for first-year college students. In a similar study, van der Meer et al. (2017) found a "clear relationship" (p. 6) between the number of peer-assisted sessions attended and achievement. Dancer et al. (2015, p. 1826) also found that the positive learning impact of peer-assisted study sessions had moderate, positive effects on high-achieving students, but was somewhat higher for lower-achieving students. Many researchers agree that various forms of peer-learning can result in knowledge acquisition and positive student outcomes.

Peer-led teams, another form of peer-to-peer learning, have a positive impact on student learning. In a qualitative study with 20 college students, Muller, Shacham, and Herscovitz (2017) reported that peer-led team learning had a positive influence on student achievement. Mean grades of students who participated (66.11) in peer-led workshops were significantly higher than students who did not participate (63.01) in peer-led workshops (Muller et al., 2017). Muller et al. (2017) also found that the standard deviation (20.36) among peer-led workshop participants was also lower than the standard deviation (22.57) of students who did not participate. Moreover, Muller et al. (2017) noticed grade improvement among all students, including the strongest, weakest, and average. Student learning, of the course content, was also enhanced by Peer-led team learning (Finn & Campisi, 2015).

Although many researchers report that peer-to-peer learning has a positive influence on student achievement, not all researchers share the same optimism. There

were mixed results for nursing teacher candidates who participated in peer-assisted learning communities (Williams & Reddy, 2016). In a meta-analysis, Williams and Reddy (2016) found that student performance improvement for nursing teachers participating in peer-assisted learning was mixed. Similarly, in a different meta-analysis of peer-to-peer teaching in higher education, Stigmar (2016) reported that critical analysis of the findings did not suggest that peer-to-peer teaching resulted in more exceptional student achievement and higher student grades. While Stigmar (2016) identified pedagogical benefits from peer-to-peer teaching, the meta-analysis indicated that it was unclear whether peer-to-peer education leads to deep-level learning (p. 134). Peer-to-peer teaching may be an outlier to the other forms of peer-to-peer models analyzed in this literature review. While many benefits to peer learning are known, not all researchers agree to the degree of academic improvements and achievement benefits.

Pedagogical and psychological benefits can be manifested in peer-to-peer learning. Some pedagogical benefits of peer-to-peer were reported by Hanson et al. (2016) and Stigmar (2016). Hanson et al. (2016), reported that peer-to-peer learning was an "important pedagogical practice" (p. 191). One notable pedagogical benefit of peer-to-peer learning included peer leadership gains. Muller et al. (2017) in a qualitative study, reported that peer-led team learning has a positive influence on student achievement as well as a positive impact on peer leader gains. Participant roles in peer-to-peer learning oscillate between a student role and teacher role throughout the process (Williams & Reddy, 2016). Playing the teacher role in a peer-to-peer learning environment has added benefits beyond knowledge and skill acquisition. While Williams

and Reddy (2016) found mixed results in student performance improvement in their study, they did find that students who play the teacher role in peer-to-peer learning tend to learn more (Williams & Reddy, 2016). Additional pedagogical benefits of peer-to-peer learning were increased critical thinking (Finn & Campisi, 2015; Stigmar, 2016) and other thinking skills (Muller et al., 2017). Stigmar (2016) found that higher education teachers who participated in peer-to-peer learning reported increases in motivation, collaboration, communication, and autonomy.

Many benefits of psychological well-being have also been reported from participating in peer-to-peer learning. Participation in peer-to-peer learning reduces participant anxiety (Finn & Campisi, 2015; Korhonen, Heikkinen, Kiviniemi, & Tynjälä, 2017), improves collegiality (Finn & Campisi, 2015), increases social cohesion (Mkonto, 2017), and positively influences personal well-being regardless of sex, race, or academic performance level (Hanson et al., 2016). Bell and Lygo-Baker (2019), who facilitated a small-scale qualitative study of college students, had mixed results. In their study, most students reported increased interactions with peers, while other students reported decreased interactions with peers (Bell & Lygo-Baker, 2019). Overall, various forms of peer-to-peer learning tend to reap both pedagogical and psychological benefits for participants.

Online Peer-to-Peer Learning. Online peer-to-peer learning, especially long-distance online learning (Lynch et al., 2014), is still an emerging field, and there remains much to be learned about peer-to-peer e-learning among first-year teachers. This literature review revealed little research that examined peer-to-peer e-learning dynamics

and outcomes. Of the studies that examined peer-to-peer actions in professional development networks, fewer than ten studies involved teacher participants. Professional development networks or professional learning networks were quite different from the peer-to-peer e-learning model researched in this study, and many of these studies were not included in this literature review.

During this research, scholars and researchers were studying an array of topics related to peer-to-peer e-learning. One area of focus was interaction in peer-to-peer e-learning. Sharing experiences, knowledge, and artifacts were a driver in online interaction and engagement. In a qualitative survey of 732 K-12 teachers, Krutka et al. (2016) examined teacher engagement in professional learning networks. The findings led Krutka et al. (2016) to develop a model of effective teacher interactions in professional learning networks. The model consisted of five elements: engaging, discovering, experimenting, reflecting, and sharing (Krutka et al., 2016). Sharing professional knowledge was not only a driver in course interactions but sharing expert knowledge was the main reason teachers participated in online professional learning networks (Trust, 2017). Sharing other things such as artifacts, experiences, learning goals, and learning outcomes also promoted engagement through peer-formative feedback (Gikandi & Morrow, 2016). One benefit of peer-to-peer e-learning was the capability to share professional knowledge, growth, and experience, which may be different than in traditional face-to-face settings. The course structure was another driver for student interaction. In an ethnography study of 20 teachers, Robson (2016) studied peer interactions and discovered that teacher agency, the concept that the teacher had some say

and control in personal and professional learning, was “subservient to structure” (p. 135). The more structure designed into a course, the less ability a learner had to exercise agency. Robson’s (2016) findings suggested that online course designers should consider the impacts of course design and structural forces on peer interactions in e-learning.

A second peer-to-peer online research theme that surfaced during this literature review was collaboration and engagement. Online course designers should consider that an engaging peer-to-peer e-learning process increases participation (Bone & Edwards, 2015) and fosters professional development (Altinay, 2017). Peer-assisted e-learning increased teacher participation compared to traditional lecture or classroom dynamics (Bone & Edwards, 2015). Medical students who participated in a trans-Atlantic peer-to-peer study suggested that a peer-to-peer e-learning “approach encourages peer cooperation” (Lynch et al., 2014, p. 647). Although there are many benefits of peer-to-peer e-learning, collaboration and engagement were the two most notable benefits for participants.

First-Year Teachers

Support and Collegiality. First-year teachers have a strong need to feel accepted, respected, and supported within the education community's social structure (Clandinin et al., 2015; Dugas, 2016; Kini & Podolsky, 2016; Williams & Gillham, 2016; Wong, 2004). This type of educational collegiality does not develop naturally. In a survey involving 200 preservice and 105 new teachers, Aslan and Zhu (2016) found it difficult for these types of teachers to form collegial support groups within their workplace. Although new teachers can be professional and can survive without building

strong relationships with their colleagues, new teachers that develop strong relationships with their colleagues and other essential stakeholders often thrive (Turner & Morelli, 2017). Building these collegial relationships can be difficult, heartbreaking, and elusive (Price, Coffey, & Nethery, 2015; Turner & Morelli, 2017). The benefit of building strong collegial relationships is that it can create conditions that improve teacher effectiveness (Kini & Podolsky, 2016). However, the lack of collegial support may lead to other problems, such as teacher attrition.

The absence of collegial support and the lack of feeling of acceptance into the education community may lead to the attrition of early career teachers. The rapid turnover and retention of early career teachers is a persistent and costly problem in K-12 education (Bastian & Marks, 2017; Hannan, Russell, Takahashi, & Park, 2015; Vagi, Pivovarova, & Miedel Barnard, 2017). This problem for education leaders is referred to as the "greening of the teacher workforce" (Bastian & Marks, 2017, p. 360-361). As reported by the New Teacher Center, a recent surge of new teachers has been entering the workforce over the past few years and estimated that 427,000 first-year teachers began teaching careers in 2018 (Williams & Gillham, 2016). If attrition trends continue, 20% of these 427,000 first-year teachers will not be in the teaching workforce within 3 years (Hanover Report, 2017). Even more alarming is that most of the early career teachers leaving the teaching workforce are high achievers who had the highest college entrance exam scores (Hanover Report, 2017).

Although retention and attrition were not the primary focus of this study, the concept of collegiality and peer support was a focus in a peer-to-peer e-learning

experience. Career support systems can influence career longevity and impact the immediate professional growth, development, and success of first-year teachers. In a qualitative study of 40 first-year teachers, which examined the factors influencing early career teacher attrition, Clandinin et al. (2015) reported that two of the seven themes that emerged the study were the need for new teacher support and creating a sense of belonging to the teaching community. Wong (2004), through his seminal work on teacher induction, explained that new teachers thrive when they work in professional learning communities where they were supported by their peers, colleagues, and administrators. Moreover, Wong (2004) found that teachers who work in these types of professional learning communities of support also tend to remain working in their schools and school districts.

Induction programs are designed to help first-year teachers integrate and transition into the teaching workforce and have been effective since inception. In a survey of 245 first-year teachers, Williams and Gillham (2016) found that first-year teachers collaborating on teaching standards and practice with mentors was beneficial . Helms-Lorentz et al. (2016), in a three-year study of 338 first-year teachers, found that induction programs were effective at closing the gap between the skills of experienced teachers and first-year teachers. While there is evidence that mentoring programs improve new teacher transition, there remain opportunities for improvements and challenges that still need to be addressed. One problem that continues to exist is overcoming first-year teachers not adequately prepared for the task of teaching. In a three-year study of 338 first-year teachers, Helms-Lorentz et al. (2016) found that all the

benefits of induction programs for new teachers do not make up for the lack of teacher education. Induction programs were not necessarily fulfilling the social needs of first-year teachers. Thompson, Hagenah, Lohwasser, and Laxton (2015), in a two-year qualitative study of novice high school science teachers, found that the pairing of new teachers with accomplished mentors was insufficient support.

When teachers do not feel supported by the induction program, their mentors, or others around them, they could become overwhelmed by loneliness (Aslan & Zhu, 2016). In a survey of 305 preservice and new teachers, Aslan and Zhu (2016) found that providing new teachers regular time to communicate and collaborate was therapeutic. Aslan and Zhu (2016) also found that collaboration time helped first-year teachers cope with similar issues and gave them a chance to learn from each other socially. First-year teachers in my study had an opportunity to connect, communicate, and collaborate, perhaps in a therapeutic way, by participating in peer-to-peer e-learning.

Many benefits are provided through the presence of a supportive, collegial working environment. In a review of 30 studies conducted over 15 years, Kini and Podolsky (2016) surmised that a supportive, collegial work environment leads to a higher degree of teacher effectiveness. Two drivers in a collegial working environment that lead to greater teacher effectiveness are feedback and cooperative learning. The opportunity to receive meaningful feedback from the community increases through a supportive, collegial environment (Evens et al., 2017). Too often, however, the only useful feedback first-year teachers receive are from persons in a position of authority such as their mentor, instructional coach, team lead, or administrators. Feedback, solely from persons

in a position of authority, ignores substantial voices and ideas from the professional learning community. Opportunities for cooperative learning successes also increases in a supportive and collegial working environment. A first-year teacher's sense of self-efficacy is enhanced with these early successes (Jolliffe & Snaith, 2017). First-year teachers desire to learn cooperatively but are not given many opportunities to do so (Jolliffe & Snaith, 2017). In a qualitative study that examined cooperative learning of six student teachers, Jolliffe and Snaith (2017) found early successful experiences. Even though this small sample may not be generalizable, the benefits of peer-to-peer e-learning are evident.

A significant theme in the current literature was social support and collegiality of first-year teachers. First-year teachers have a strong need to feel accepted, respected, and supported within the social structure of the education community where they teach (Clandinin et al., 2015; Dugas, 2016; Kini & Podolsky, 2016; Williams & Gillham, 2016; Wong, 2004). First-year teachers become more effective teachers when support and collegiality exist (Kini & Podolsky, 2016), they thrive in their role as an educator (Turner & Morelli, 2017), and tend to continue their teaching career Clandinin et al. (2015).

Inexperience Inequities. "The teaching profession faces a shortage of teachers as well as a decline of teaching skills" (Helms-Lorentz et al., 2016, p. 178). With an estimated 427,000 new teachers entering the teaching profession, education leaders need new ways to quickly, efficiently, and effectively improve professional practice deficits of first-year teachers. Grissom et al. (2015) found that inexperience and teaching skill deficits created inequities in the quality of teachers that students received from year to

year. A student who receives a new teacher does not have the same opportunities for achievement gains due to the lack of teaching experience (Kini & Podolsky, 2016).

Moreover, new teachers, who have 1 to 3 years of experience, have an attrition rate as high as 20% (Goldring et al., 2014; Hanover Report, 2017) and are much less skilled than teachers with some experience (Helms-Lorentz et al., 2016). Professional practice deficiencies and teaching skill deficiencies of new teachers potentially reduce student learning (Helms-Lorentz et al., 2016), and low performing teachers cause inequities for students. Inequities are also created by teacher attrition from the education workforce, which create a revolving door of new teachers for some students (Kini & Podolsky, 2016) and exacerbate the inequity problems.

The quality of the teacher a child receives from year to year can significantly impact a child's level of achievement and career. In fact, "having an effective teacher could dramatically alter students' educational and economic outcomes" (Adnot, Dee, Katz, & Wyckoff, 2017, p. 54). In a review of 30 other studies, Kini and Podolsky (2016) found that student achievement was positively associated with teaching experience. In most cases, the more experience a teacher had, the higher the likelihood of increased student achievement, but there was variability in teaching abilities regardless of experience or background (Kini & Podolsky, 2016). Strengthening first-year teacher professional practices leads to more effective and higher-skilled teachers, making learning opportunities for all students more equitable despite the inexperience of first-year teachers. Higher-skilled teachers create better learning opportunities for students, but higher-skilled teachers are also more likely to continue teaching at their school and

not leave the workforce. Higher-skilled teachers are 2.5 times more likely than lower-skilled teachers to come back and teach in the same school (Helms-Lorentz et al., 2016). To address the teacher quality inequities faced by students, education leaders need to have the means necessary to effectively and efficiently improve professional practices of first-year teachers and retain them.

Perceptions. How teachers perceive their preparation and readiness for teaching impact teacher success. First-year teachers generally perceive being well prepared for instructional skills (Bowsher, Sparks, & Hoyer, 2018). Approximately 68% of first-year teachers reported being well-prepared for instructional duties, while 32% reported not being well-prepared instructional duties (Bowsher et al., 2018). First-year teachers were not as comfortable and confident in their preparation to manage other aspects of teaching related to classroom management, such as dealing with discipline. Approximately 55% of first-year teachers felt well prepared for dealing with discipline issues, while 45% did not feel well prepared for dealing with discipline issues (Bowsher et al., 2018). In a survey of 245 new teachers, Williams and Gillham (2016) found that first-year teachers felt like the combination of teacher preparation programs and the supporting structures on the job helped them meet reach teaching standards. Principals, however, had a different perception of first-year teacher preparation. Principals were satisfied with teacher attitudes and affective approaches but felt less satisfied with other vital areas of teaching (Shepherd & Devers, 2017).

Teachers report feeling overwhelming pressures. Manuel and Carter (2016) found that the pressure that first-year teachers feel about high-stakes testing harmed the

sense of professional agency or teacher agency they had in their classroom practice. When there is professional agency, there is increased teacher "participation in decision-making processes," which impact professional practices in their classroom (Manuel & Carter, 2016, p. 101). Similarly, Unwin (2015) found that teachers felt like they were under significant pressure, and the pressure teachers felt put them into survival-mode instead of practitioner-mode.

Teacher Preparation. Education researchers are continually looking for ways to improve teacher preparation programs to better prepare first-year teachers with teaching skills and professional practices needed to be successful. The National Council of Teacher Quality (NCTQ) reported that out of 1,612 teacher preparation programs reviewed, only 107 programs received top scores, while 848 programs, the majority of teacher preparation programs, received the lowest scores (Hanover Report, 2017). In the Teacher Prep Report 2014, NCTQ used a 125-point scale to rate teacher preparation programs with the lowest-level teacher preparation programs earning less than 51 points and highest-level teacher preparation programs earning more than 82 points (Greenberg, McKee, & Walsh, 2013). Of the 1,612 teacher preparation programs, only 6.6% of performed at the highest level, while 52.6% performed at the lowest level by scoring less than 51 points out of 125 points possible (Greenberg et al., 2013). There continue to be many challenges ahead for teacher preparation programs. One challenge is placing credentialed teachers in every classroom.

A growing number of teachers in the workforce are teaching without a license. Hanover Report (2017) reported that approximately 25% of all new teachers lacked

teaching licenses in their fields (p. 11). The lack of quality preparation programs and the growing number of unlicensed teachers create challenges for school leaders and for underprepared teachers entering the demanding and stressful field of teaching. The teaching skills learned at teacher preparation programs are the tools teachers need to be successful. Teachers who enter the teaching profession with "higher teaching skills" (p. 191) are more likely to succeed and remain in the teaching profession (Helms-Lorentz et al., 2016). The first-year teaching skills of teachers who remain in education are much higher than those who typically leave the career (Helms-Lorentz et al., 2016). "Trained teachers are effective teachers" (Wong, 2004, p. 55). One way to increase teaching skills and teaching experience is through teaching apprenticeships. In a two-year longitudinal study of 45 math teachers, Desimone, Hochberg, and McMaken (2016) concluded that teacher preparation programs could benefit from longer and higher quality teacher apprenticeships (p. 45). While researchers make clear that more is needed to improve teacher skills in teacher preparation programs, school districts across the country rely on modern educator evaluation tools to do the same.

Teacher Evaluation

An effective teacher evaluation system to measure educator effectiveness is necessary to ensure that all children have equal access to quality teachers. This section focuses on measuring teacher performance, evaluation rater, and the impacts of attrition and retention of teachers.

Every child deserves a highly effective teacher. A child who has an effective teacher has economic and educational advantages (Adnot et al., 2017), manifested by

better job opportunities and higher achievement. Placing and developing highly effective teachers in each classroom continues to be a challenge for education leaders and policymakers (Ramirez, Clouse, & Davis, 2014). School districts use educator evaluation systems to measure and improve the professional practices and skills of teachers. Modern teacher evaluation systems, like the State Model Evaluation instrument, which uses teaching standards as the basis for evaluation, align with student achievement on standardized assessments (Steinberg & Garrett, 2016; Xu, Grant, & Ward, 2016). There is a link between student achievement and teacher evaluation scores. This link is a critical feature of modern teacher evaluation systems which use multiple types of measures to evaluate teacher effectiveness. Some call teacher evaluation instruments that use student achievement scores *high-stake* evaluation systems. High-stakes evaluation systems that are used to improve professional practices may also be used for promotions or as a tool for removing ineffective teachers (Steinberg & Garrett, 2016). Steinberg and Garrett (2016) cautioned against solely using observational measures in teacher evaluations to make high stake decisions about teachers.

Measuring Professional Practices of Teachers. At the heart of every teacher evaluation system are the metrics used to measure teacher performance and the evaluators who observe and record the measurements. There is considerable, new research around collecting and using multiple measures in teacher evaluation systems. Education policymakers feel compelled to include various measures into teacher evaluation frameworks (Martínez, Schweig, & Goldschmidt, 2016; Steinberg & Kraft, 2017). Principals tend to agree on the value of using multiple measures as part of measuring

teacher effectiveness. In a survey of 219 principals, Yariv and Kass (2017) found that using a variety of measures to evaluate teachers led to more successful teacher evaluations . The principals who participated in the survey also recommended using multiple observers in the teacher evaluation process. School leaders and policymakers both saw various measures as a way to improve the effectiveness of teacher evaluation.

Including multiple measures in teacher evaluation systems to evaluate teacher performance has been a recent focus for many education researchers. The main focus of teacher evaluation reform has been in the following 3 areas: "multiple measures," "multiple performance ratings categories" as well as "professional support and incentive structures" (Steinberg & Kraft, 2017, p. 378). Using MET data from 389 fourth and fifth-grade teachers in six school districts, Martínez et al. (2016) found that the "accuracy and consistency" (p. 738) of a teacher evaluation system that used multiple measures varied based on the intended use. The level of accuracy and consistency increases if the evaluation system is used to maximize reliability (Martínez et al., 2016). On the other hand, the accuracy and consistency of evaluation results decreases when the evaluation tool is used to predict student learning outcomes (Martínez et al., 2016). Misapplying the evaluation instrument demonstrates that the intended use of an evaluation tool could alter its capability to accurately and consistently measure teacher effectiveness (Martínez et al., 2016). To avoid misapplication of the evaluation tool, modern evaluation systems should separate professional practice measures from student outcome measures. After analyzing the same MET data aforementioned, Polikoff (2015) stressed the importance of not using student learning outcomes as the only measure of teacher effectiveness, but

making student learning outcome measures just another part of the educator effectiveness equation. The benefits of using multiple criteria in modern teacher evaluations continue to be evidenced. Many school policies are following that trend. Too often, however, evaluators resort to formal observations as the primary measure of teacher performance (Steinberg & Garrett, 2016), disregarding the benefits of multiple measures in teacher evaluation.

Despite the concentrated focus on and the reported benefits of using multiple measures, researchers differ on how to best apply multiple measures in teacher evaluation. Steinberg and Garrett (2016) question whether multiple observational measures, which are common in most teacher evaluation systems, accurately characterize teacher effectiveness. Using MET data over two-years of 834 fourth-ninth grade teachers, Steinberg and Garrett (2016) concluded that teacher evaluations should include multiple measures over multiple classes over multiple years to more accurately determine teacher effectiveness. Multiple measures, including observations, artifacts, and student outcomes, can be used to triangulate data measuring teacher performance, but the quality of the measure matters. Teacher performance measures that were inaccurate and inconsistent do not lead to better teacher evaluations. Instead, using evaluations with combined multiple measures that are inadequate leads to greater complexity and more confusion (Martínez et al., 2016).

Evaluators and Raters. A crucial factor in the teacher evaluation process is the role of evaluator. Evaluator attitudes, perceptions, and rater skills affect educator effectiveness results. When it comes to new teachers, Shepherd and Devers (2017) found

that principals perceived new teachers differently than other teachers. While principals were satisfied with new teachers' affective and attitudinal characteristics, they were less satisfied with professional practices around instruction (Shepherd & Devers, 2017, p. 37). What impact do preconceived attitudes of evaluators had on teacher evaluation scores? The answer to that question was not clear.

Not much is known about evaluators. Lawson and Cruz (2017) found that very little was known about the relationship between rater characteristics and teacher evaluation scores. In a validation study of a teacher evaluation system, similar to the State teacher evaluation model used in my study, Xu et al. (2016) found that raters tend to inflate scores in areas where qualitative data were collected. Conversely, the scores in quantitative areas were consistently lower than those in the two highest-scoring qualitative areas (Xu et al., 2016). Even with the tendency to rate quantitative areas lower, Xu et al. (2016) found that all six evaluator ratings used in the teacher rating system did correlate with one another. The lack of research on raters or evaluators is concerning to me, considering how much the teacher evaluation was based on rater observations and subjective scoring.

Classroom observations continue to be an essential part of modern teacher evaluation tools (Cohen & Goldhaber, 2016; Steinberg & Garrett, 2016). Generally speaking, the purpose of including formal and informal teacher observations is to provide timely feedback and to evaluate teacher performance (Kettler & Reddy, 2017). Teacher observation measures may be used as a predictive tool in the future. In a quantitative study involving 1126 student teachers and 3 years of data, Vagi et al. (2017) found that

observational data were a reliable, predictive indicator of "future entrance and retention" (p. 11) in the teaching profession. If generalizable, this finding may lend credibility to using observational measures to predict the retention probability of new teachers. However, researchers are still not sure about the impact of predictive indicators on the future of teacher evaluations. While some researchers give credibility to observational measures, others disagree on the overall impact of teacher observations in determining teacher effectiveness.

The concern among researchers relative to observational measures was the ability of these measures to measure their intended targets accurately and consistently. For example, Cohen and Goldhaber (2016) wrote that observational data ineffectively differentiated teacher performance. After analyzing 2 years of MET data, Polikoff (2015) remained doubtful on the effectiveness of observational measures in teacher evaluations. Polikoff (2015) recommended that researchers study new ways to bring more stability to observational measures. Similarly, Cohen and Goldhaber (2016) called on researchers to apply more "empirical scrutiny" to observational measures in teacher evaluations.

Teacher evaluators are usually school administrators, but researchers have been studying evaluator models that use multiple evaluators. Some researchers are even studying the impact of using peers as evaluators. Cohen and Goldhaber (2016) pointed out that not much was known about the effectiveness of non-administrator evaluators. In a quantitative study of three principals and 19 special education teachers, Lawson and Cruz (2017) examined if the evaluator or rater-type mattered. Lawson and Cruz analyzed administrator ratings of special education teachers and special education teacher ratings

of their peers. They found that special education teachers were less lenient in their evaluator ratings than administrator evaluators. The evaluator type makes a difference in the evaluation results, but, as Cohen and Goldhaber (2016) point out, more research is needed to understand evaluator rating differences with various evaluator types. The relationship between the evaluator and teacher matters as well as the relationship between the online teacher and learner.

Transactional Distance

Transactional distance is the physical and the psychological space between the teacher and learner. The concept of physical and psychological transactional distance is not limited to distance learning. Learners in traditional classrooms also experience transactional distance. In distance education, transactional distance can increase and require special andragogy (Moore & Kearsley, 2011). Not all distance education courses and designs are created equal when it comes to transactional distance. Moore and Kearsley (2011) described distance education programs as being either "more distant or less distant" (p. 209). Researchers have been revealing conditions and factors that impact transactional distance among teacher, learner, content, and interface. Researchers have recently discovered new factors and elements of distance education that increase transactional distance, decrease transactional distance, and have no impact on transactional distance. The next section focuses on the factors that influence transactional distance.

Increasing Transactional Distance. Transactional distance in e-learning environments is variable and is influenced by many variables. Geographical distance is

one factor that influences learner perceptions of transactional distance. In a qualitative study, Kassandrinou, Angelaki, and Mavroidis (2014) found that students attributed their perceived online transactional distance to the actual geographical separation between learners. Students suggested that if the geographical distance between them had been closer, they likely would have had more contact with other learners, thus reducing perceived transactional distance (Kassandrinou et al., 2014). Subtle differences in learner characteristics and demographics can also impact transactional distance. The learner's age and ethnicity impact perceived transactional distance (Huang, Chandra, DePaolo, & Simmons, 2016). For example, traditional college students (18-24 years old) experience greater transactional distance compared to non-traditional college students (25 and older) (Huang et al., 2016). The low learner autonomy within the 18-24 age group was believed to be the underlying cause of increased transactional distance (Huang et al., 2016). Ethnicity is a variable that impacts transactional distance. In a study that involved 227 university students, Huang et al. (2016) found that non-Caucasian students experienced lower transactional distance than Caucasian students.

A learner's perception of transactional distance is influenced by multiple factors. Vasiloudis, Koutsouba, Giossos, and Mavroidis (2015) found that the amount of transaction distance was generally higher early in an online course and gradually decreased over time as the course and learner both evolved. Information and communications technology (ICT) also impact a student's perception of transactional distance. In a mixed study of 308 preservice primary teachers, Larkin and Jamieson-Proctor (2015) found that ICT issues experienced over two years increased transactional

distance. Some ICT elements, however, have a positive effect and decrease a learner's perceived transactional distance. Communicating by Web 2.0 tools instead of through email or discussion threads can reduce the transactional distance (Huang et al., 2016, p. 743). The length of time between work submission and teacher feedback can also impact transactional distance. Slower feedback turnaround time increased transactional distance. Learner perceptions of transactional distance increase with slow feedback, problems with ICT, age, and ethnicity.

No Impact on Transactional Distance. Some e-learning variables have no impact on perceived transactional distance. For example, male and female learners do not view transactional distance differently. Horzum (2011) found that neither gender nor topic in distance education impact perceived transactional distance. Similarly, Firat (2016), in a study designed to measure learner autonomy of 3,293 distance education students, found that gender had no bearing on learner autonomy. In total, researchers reported that few variables did not impact perceived transactional distance.

Decreasing Transactional Distance. Several factors can reduce perceived transactional distance. For example, the learner mindset and attitude toward distance learning impact transactional distance, which directly impact learning (Kassandrinou et al., 2014). Student perceptions of distance learning matters (Horzum, 2011; Huang et al., 2016). In a survey of 227 university students, Huang et al. (2016) found that students who preferred e-learning over face-to-face learning had lower perceived transactional distance. Horzum (2011) also found that students who brought a positive attitude to blended learning had a lower sense of perceived transactional distance. Knowing and

understanding the impact of learner mindsets and attitudes towards distance learning and blended learning can be beneficial for course designers and online instructors.

Transactional distance can be reduced through the intentional use of course structure and dialogue. By increasing the amount of course structure, course designers can increase learner interactions (Forte, Schwandt, Swayze, Butler, & Ashcraft, 2016). Learning and achievement are impacted by the quantity and quality of online interactions (Ekwunife-Orakwue & Teng, 2014; Huang et al., 2016; Jaggars & Xu, 2016; Miller, 2015). Huang et al. (2016) found that high structure and high dialog created the least amount of transactional distance among online university students. Conversely, Huang et al. (2016) found that low structure and low dialogue created the highest amount of transactional distance. Learners who were required to participate in online discussions had lower perceived transactional distance than students who were not required to participate (Forte et al., 2016; Huang et al., 2016). Requiring learners to participate in online discussions also increases learners' cognitive abilities (Dubuclet et al., 2015). In a survey of 2,216 university students, Forte et al. (2016) found that course structure which supported high learner-instructor engagement decreased transactional distance. In a world, where giving learners more choice and agency are popular, online course designers should consider the benefits of increasing interactions through course structure and required dialogue.

Teaching Behaviors. Moore and Kearsley (2012) view teaching behaviors as a variable that regulates levels of transactional distance in an online course that was desired at best or tolerable at least. Structure and dialog are the two primary online teaching

behavior variables that impact transactional distance (Moore & Diehl, 2019). Structure, which refers to course design, is designed from elements such as presentations, course outcomes, learning objectives, assessments, assignments, and visuals. Adding additional structure may result in greater transactional distance (Huang et al., 2016; Moore & Diehl, 2019). However, that was not always the case. Forte et al. (2016), found that increasing the amount of structure around dialog between teacher and learner decreases Transactional Distance. The role of the teacher in online learning is discussed in the next section.

Teacher Presence. The amount of teacher touch applied in an online classroom influence the amount of energy a student invests in learning (Moore, 2016, p. 132). Online learning success may hinge on designing the appropriate amount of teacher presence in an online course. A teacher's presence in an online course can help students learn and succeed (Dockter, 2016; Quong et al., 2018). In a mixed-method study involving 330 university students, Quong et al. (2018) found that more students perceived learning had occurred by increased teacher presence through teacher engagement, encouraged interactions, and meaningful dialogue (p. 4). Dockter (2016) also noticed that a more substantial teacher presence helped students learn and succeed by improving teacher-learner relationships. However, Dockter (2016) found that a teacher's assumption that they could control their online teaching presence could increase negative pressure on transactional distance and prevent relationships from forming. Teacher presence can be increased by increasing course structure, and even more significant teacher presence can be created through dialog engagement.

One online teacher role is to promote dialogic interactions (Miller, 2015). In a mixed study of 55 high school students, Dubuclet et al. (2015) found that the teacher's role in dialogic interactions increased student learning. Another online teacher role is to promote student engagement in discussions and other forms of dialogic exchanges. Teacher promotion of participation and engagement was shown to have a significant impact on student engagement in dialogic exchange and was done by encouraging and leading students into more in-depth conversations (Johnson, 2016). Johnson (2016) also reported that through careful planning and discussion design, instructors "improve collaborative learning and knowledge construction" (Johnson, 2016, p. 1483). As discussed, the teacher plays an essential role in leading dialogic exchanges, but that role may be overrated. In a quantitative study of 342 college students, Ekwunife-Orakwue and Teng (2014) found that there was more interaction between learner-content than learner-teacher and learner-learner. This finding brings into question the role online teachers play in facilitating and promoting dialogic exchange. The amount of teacher touch and the role of teacher interaction in distance education continue to be debated.

Interactions. Interactions that occur throughout the online learning experience is the most critical concept in distance learning (Moore, 1993). Interactions are transactions that occur between the distance learner and all the elements that comprise the learning experience. Student achievement was found to be impacted by the quantity and quality of online interactions (Ekwunife-Orakwue & Teng, 2014; Huang et al., 2015; Jaggars & Xu, 2016; Miller, 2015). Educational technology researchers most often recognize two forms of interpersonal interactions plus interaction with content (Ekwunife-Orakwue &

Teng, 2014; Huang et al., 2015; Xiao, 2017). Interpersonal interactions are transactions between learner-teacher and learner-learner, while content interactions are between the learner and the content components inside the e-learning environment. More recently, researchers have given attention to learner-interface interactions to understand better how factors such as learning management systems, media use, visualization, usability, and functionality impacted cognitive load in online learning (Huang et al., 2015). Although there has been a recent decline in research around interactions in distance learning (Karataş, Yilmaz & Dikmen, 2017), researchers continue to explore ways to leverage and increase interactions in online learning spaces.

Participants in an online course require different types of interactions to meet their learning needs and learning styles (Miller, 2015, p. 200). Interpersonal interactions are the subject of many studies that provide researchers and scholars a deeper, richer understanding of the underpinnings of transactional distance theory. These interactions result from two types of dialogue (Huang et al., 2015) between distance learning participants. The two types of dialogues are learner-teacher interactions and learner-learner interactions. The bond between learner-teacher was found to be a function of learner-teacher interaction frequency (Dockter, 2016). In a qualitative study of 678 university students, Jaggars and Xu (2016) found that students placed a higher value on learner-teacher interaction than on learner-learner interaction. However, in that same study, students perceived that the learner-learner interactions were required and not helpful (Jaggars & Xu, 2016). The quality and purpose of interpersonal interactions are essential to successful online learning experiences. The quality of learner-learner

interaction is a predictor of learner satisfaction (Bağrıacık Yilmaz & Karataş, 2018) and the quality of all interactions positively influence student achievement (Jaggars & Xu, 2016).

So far, researchers have focused much of their work on the interpersonal aspects between learner-teacher and learner-learner (Xiao, 2017). Less research has been conducted around learner-content interaction. Having a better understanding of learner-content interactions has become increasingly important in recent distance learning movements (Ekwunife-Orakwue & Teng, 2014) and research. In a quantitative study involving 342 university students, Ekwunife-Orakwue and Teng (2014) found that interpersonal interactions such as learner-teacher and learner-learner were low compared to learner-content interactions. Conversely, Paul et al. (2015) in a validation study of Zhang's Transactional Distance Scale, surveyed 183 university students and found that students perceived that learner-teacher interactions had the greatest impact on their learning followed by learner-content interactions and learner-learner interactions, respectively. Learner-content interaction is being recognized as an increasingly important sub-construct of transactional distance and is becoming a growing area of focus for distance learning researchers.

Student engagement and learner satisfaction are impacted by online learning interactions (Bağrıacık Yilmaz & Karataş, 2018; Kleinsasser & Hong, 2016; Paul et al., 2015, p. 379). The level of interpersonal interactions and content interactions are significant indicators of student engagement and connectedness to learning (Paul et al., 2015). Kleinsasser and Hong (2016) explained that regardless of various online course

design structures, students who feel connected to learning were more motivated to learn, more engaged in activities, and reported a higher level of course satisfaction. Online learners had increased engagement and higher achievement through their interactions.

The quality of interactions and frequency of interactions affected student achievement. Jaggars and Xu (2016) found that while using and leveraging learning technologies were appreciated by students; those things did not impact student grades. In a quantitative study of 678 university students in 23 courses, Jaggars and Xu (2016) discovered that frequent and effective interpersonal interactions were a better predictor of student grades in an online course. Similarly, over five years, while following 117 graduate students, Miller (2015) concluded that student achievement was related to the time spent in an online course and the frequency of their interactions.

Researchers disagree on which interactions have the most significant impact on achievement and satisfaction. Student achievement (Jaggars & Xu, 2016; Miller, 2015) and student satisfaction (Bağrıacık Yilmaz & Karataş, 2018; Jaggars & Xu, 2016) are connected to interpersonal interactions in online learning. In a survey of 678 university students, a higher value was placed on learner-teacher interaction than on learner-learner interaction (Jaggars & Xu, 2016). However, Bağrıacık Yilmaz and Karataş (2018), who surveyed 177 university students, discovered that learner-learner interaction was a key factor in predicting learner satisfaction. At the time of my study, the impact of learner-content interaction was receiving increasing attention from researchers. In many cases, there were more frequent interactions between learner-content than between learner-teacher and learner-learner (Ekwunife-Orakwue & Teng, 2014). When compared to

interpersonal interactions, more significant achievement and increased student outcomes were linked to learner-content interactions (Ekwunife-Orakwue & Teng, 2014; Miller, 2015). Although there is little disagreement on whether online interactions impact achievement, it is clear that the researchers need to learn more about how interaction types impact learner achievement.

Dialogue. Dialogic learning is an essential construct in the e-learning process. Moore's (2016) *standard practice* of managing online dialogue involved the consolidation and sharing of weekly discussion themes with learners to demonstrate to the learners what they had created together. Recently, researchers have examined dialogic learning and dialogic interactions related to distance education. Simpson (2016), who observed 100 university students, noted that dialogic learning, even though it was not assessed, played an essential role in the learning process. Simpson (2016) revealed that student perceptions of their learning environment could be improved through dialogic pedagogy. The use of dialogic interactions in distance education increases learner participation with other learners and content (Quong et al., 2018). Dialogic interactions also create deeper learning and meaning (Johnson, 2016; Simpson, 2016). Andrade (2104) revealed that the use of course structure and dialogue in self-regulated e-learning kept learners on task and produced higher quality work. Course designers must give careful consideration to structure and dialog, which work together in online learning environments.

Structure. Course designers generally consider the impact of course structure on distance learning. The elements and design of the teaching-learning program in distance

education are explained by structure (Moore, 2013). The three major factors of distance education include structure, dialogue, and learner autonomy (Moore, 2013). An online course is described as having little structure or being highly structured. Huang et al. (2016) explained that a highly structured course includes interactions between learner-content as well as learner-interface. The amount of structure needed in an online course depends on the level of learner autonomy and the amount of transaction distance learners are willing to tolerate (Moore & Kearsley, 2012). Instructional designers can account for transactional distance tolerance in their course designs by managing the levels of structure and dialogue (Andrade, 2014; Moore & Diehl, 2019). For example, high levels of structure and high levels of dialogue can be used for students with lower learner autonomy (Huang et al., 2016).

Researchers understand the impact of courses with high structure and high dialogue. Quong et al. (2018) discovered that courses with high structure lead to high levels of interaction as well as increased learner perception of learning. In a mixed-method study of 308 preservice, primary math teachers, Larkin and Jamieson-Proctor (2015) found that high structure and high dialogue were necessary pedagogy to change negative attitudes towards mathematics. On the other hand, Andrade (2014) found that the lack of dialogue and low structure in an online course for university students leads to superficial rather than deep learning. Shearer, Gregg, and Joo (2015) opined that dialogue in discussion forums was useful for "surface learning experiences" (p. 133). Deeper learning happened in other course activities. In a quantitative study of 678 university students in 23 courses, Jaggars and Xu (2016) found that "well-organized

courses with well-specified learning objectives" had no bearing on student grades. By knowing how course structure elements impact student learning, course designers and online instructors can more effectively manage the elements of the teaching-learning structure.

Learner Autonomy. Learner autonomy is the capacity of someone to make their own learning decisions (Moore & Kearsley, 2012). Dockter (2016) explained that various aspects of distance education, including interactions, communication frequency, course structure, and the relationships formed between teacher and other participants, impact learner autonomy. The participants in an online course which demands learner autonomy require learners who have developed learning and study habits (Huang et al., 2015). Less responsibility is placed on the teacher and more responsibility is placed on the learner to achieve (Moore & Kearsley, 2012). Not all learners are at the same level of learner autonomy. The level of emotional intelligence has been found to be a pivotal factor in determining if a student is ready to learn autonomously (Valizadeh, 2016).

Learning autonomy space can be created. Through observational analysis, Szczepek-Reed (2017) noticed that limiting the role of the instructor can create learner autonomy space; however, students still need support and space to engage. Striking a balance with learner autonomy in e-learning designs is challenging (Moore, 2016). Online course designers can promote or discourage learner autonomy using course structure (Dockter, 2016); however, the instructor is primarily responsible for creating spaces for learner autonomy (Benson & Samarawickrema, 2009; Szczepek-Reed, 2017). McKenna (2018) interviewed 23 university students and found that teachers can create

learner autonomy by giving students control over forums and discussion threads. Course designers and teachers, however, should be aware that intentional efforts to increase learner autonomy could be at the detriment of the teacher, causing the teacher to be disappointed in their online experience (McKenna, 2018). To that end, Szczepek-Reed (2017) suggested that the concept of creating space that was less asymmetrical between the teacher and learner could be done "in situ" as opposed to "established hierarchies" (p. 175). Co-constructing the learning space is another way for teachers to work with learners to create both symmetry and learner autonomy.

There is more evidence to support that learner autonomy can be promoted or discouraged. In a mixed-methods study of 330 university students, Quong et al. (2018) found that social interactions and learner-learner dialogue can reduce the sense of learner autonomy. Information and communication technology, as well as social media platforms, are linked to learner autonomy. The level of information and communication technology use also impacts learner autonomy capacity. Learner autonomy in e-learning was found to be directly proportional to the level of information and communication technology use (Firat, 2016). In other words, the more that students used various forms of media to create, store, and retrieve digital information, the greater the capacity for learner autonomy.

Future Research on Transactional Distance. Distance learning researchers across the online learning spectrum point to many areas of research needs. One common theme shared by researchers is understanding how various technology tools and the learner interactions with different technology tools impact transactional distance as well

as student learning (Kang & Gyorke, 2008; Karataş, Yilmaz & Dikmen, 2017; Miller, 2015; Paul et al., 2015; Quong et al., 2018). A second theme shared by researchers was understanding how instructional design and transactional distance constructs impact student learning and student learning outcomes (Andrade, 2014; Dubuclet et al., 2015; Ekwunife-Orakwue & Teng, 2014; Quong et al., 2018). A third theme shared by researchers was the need to learn more about dialogue and dialogic interactions. Dubuclet et al. (2015) recommended that researchers understand how various grading strategies for discussion threads influenced student learning. Moore (2016), the seminal researcher in this field, recommends research around structuring dialogue, while Shearer et al. (2015) suggests the need to understand deep learning and group dynamics in dialogic exchange. Finally, Dubuclet et al. (2015) recommends that researchers look at student participation and student cognitive levels of different discussion design strategies.

Researchers also made additional recommendations that my study attempted to address. One recommendation made by researchers was to study the impact of e-learning designs on student learning outcomes. Ekwunife-Orakwue and Teng (2014) suggests that researchers move away from measuring learning perceptions and toward measuring actual cognitive and effective outcomes. My peer-to-peer e-learning study attempted to measure learning outcomes by analyzing the professional practices of first-year teachers. Differences in the professional practice of those trained in peer-to-peer e-learning with low teacher-learner interactions and high learner-learner interactions were compared to those who were not trained in peer-to-peer e-learning. Using outcome data, such as

professional practice scores, shifted from interpreting learner perceptions and satisfaction to measuring student learning outcomes.

The second recommendation was to look into learning outcomes through the application of more authentic engagement and use the concept of "basic sharing of resources" (Quong et al., 2018, p. 19) as an example of an authentically engaged learner. In the peer-to-peer e-learning model for my study, the only resources available to participants were the resources that peers researched, gathered, and shared with their peer-to-peer e-learning classmates.

The third recommendation by researchers was to study the efficacy of self-regulated distance learning (Andrade, 2014). Peer-to-peer e-learning is an example of a self-regulated model. Learner autonomy and a self-regulated distance learning environment were elevated in the absence of teacher presence in this peer-to-peer e-learning model. I attempted to fill gaps in the literature by measuring the professional practice outcomes of first-year teachers engaged in a peer-to-peer e-learning model.

Summary and Conclusions

Learning can be a complex and systemic process that involves many interconnected elements and factors. Understanding peer-to-peer e-learning of first-year teachers is no exception. Research on the interconnected elements and factors as they relate to this study, such as peer-to-peer learning, first-year teacher readiness, teacher evaluation, and constructs related to transactional distance, were examined in Chapter 2. I used the transactional distance theory framework to bring greater clarity and understanding of this peer-to-peer e-learning design.

There is a gap in recent research around online peer-learning designs, and I did not find research that examined the professional practice outcomes of first-year teachers who participated in a peer-to-peer e-learning model. This study is unique because Teacher Quality Standard scores were used to determine if professional practices of first-year teachers improve in a highly autonomous e-learning design that had no teacher. Multiple researchers were requesting research to understand better how instructional design and transactional distance constructs impact student learning and student learning outcomes (Andrade, 2014; Dubuclet et al., 2015; Ekwunife-Orakwue & Teng, 2014; Quong et al., 2018).

Through this quasi-experimental study, I attempted to address how the instructional design of a peer-to-peer e-learning model impacts the professional practices of first-year teachers. A total of 28 first-year PreK-12 teachers (2017–2018) who received peer-to-peer e-learning training throughout the school year was compared to a historical cohort of 32 first-year PreK-12 teachers (2016–2017) who did not receive peer-to-peer e-learning training. Teacher Quality Standard scores, which measure professional practice, were collected and analyzed. The research design, methodology, and statistical analysis of this study will be explained in greater detail in Chapter 3.

Chapter 3: Research Method

The purpose of this quasi-experimental study was to determine if participating in peer-to-peer e-learning throughout a school year significantly improves the professional practices of first-year teachers as measured by Teacher Quality Standard scores. A quantitative approach was used to learn if a highly autonomous e-learning model significantly impacts the professional practices of first-year teachers.

Chapter 3 includes the methodology, research design, threats to validity, and ethical procedures used for this study. Chapter 3 also includes an explanation of the quasi-experimental research design used to determine the differences in professional practices of first-year teachers trained in peer-to-peer e-learning to first-year teachers who did not receive similar training.

Research Design and Rationale

To best answer the research question, I chose quantitative methodology over qualitative and mixed methodologies. A quantitative approach is a process used by researchers to take something observable and make it more explicit (Babbie, 2017). The quantitative methodology aligned with the aim of this study, which was to quantify changes in Teacher Quality Standard mean scores for first-year teachers who participated in peer-to-peer e-learning to those who did not participate in similar training. Quantitative research designs can be experimental, quasi-experimental, or non-experimental (Burkholder et al., 2016). Of these three quantitative research designs, the design most grounded in the scientific method is the research design, where the researcher can randomize experimental groups, and where the researcher

can control for independent variables in the study (Burkholder et al., 2016). It was impossible to use an experimental research design in this educational setting. For educational settings where randomized experimental groups cannot be formed, quasi-experimental designs can be used (Burkholder et al., 2016; Butin, 2010).

Research Design

A quasi-experimental research design is a pragmatic approach suited to find practical solutions to complex problems situated in an educational setting (Burkholder et al., 2016). The results from a quasi-experimental research design can help researchers interpret the impact of interventions (Butin, 2010). Because random assignment was not possible and archival data were analyzed, I used a quasi-experiment design.

Examining the impact of peer-to-peer e-learning by analyzing archived Teacher Quality Standard II, III, and IV scores from a historical control group of first-year teacher evaluations (2016–2017) to Teacher Quality Standard II, III, and IV scores from an experimental group of first-year teacher evaluations (2017–2018) was the aim of this study. The control group included first-year teachers (2016–2017) who did not participate in similar training. The control group for the quasi-experimental design was a historical cohort. Using a historical cohort control is considered a viable option in education research studies (Walser, 2014). A historical cohort control was used in this study because gathering and analyzing archival data did not allow for random group selection. One research question was included in this study:

RQ1. What is the difference in three Teacher Quality Standard mean scores, as measured by the State Model Evaluation instrument, of first-year teachers trained in peer-to-peer e-learning to those who did not receive similar training?

Independent and Dependent Variables

Training level, a nominal, categorical measure, was the independent variable for this study. The two training levels are (a) first-year teachers who received peer-to-peer e-learning and (b) first-year teachers who did not receive similar training. The dependent variable, a continuous measure, included three Teacher Quality Standard scores (II, III, and IV). Teacher Quality Standard scores were collected during routine observations throughout the school year by building administrators or other designated evaluators. The State Department of Education requires all public schools to observe and evaluate teachers to determine educator effectiveness (State Department of Education, n.d.). Educator effectiveness data such as Teacher Quality Standard scores measure professional practice in five Teacher Quality Standards. Teacher Quality Standard scores are measures of professional practice proficiency (State Department of Education, n.d.).

All teachers in this State are evaluated on six Teacher Quality Standards. Teacher Quality Standards I through V measures professional practice, and Teacher Quality Standard VI measures student learning outcomes. Teacher Quality Standards II, III, and IV were selected for this study because they aligned with the peer-to-peer e-learning outcomes: classroom management, student agency, effective instruction, and reflection on practice. Teacher Quality Standard I and V were not included in this study because

they were not part of the instructional design, nor were they part of the professional learning objectives. Teacher Quality Standard scores are products of administrator observations, artifacts, and work products, either submitted by teachers or collected and evaluated throughout the school year as measured by the State Model Evaluation instrument. The Instrumentation and Operationalization of Constructs section include detailed information about evaluation scores and the State Model Evaluation instrument.

Intervention

Peer-to-peer e-learning, an innovative, 21st century professional learning opportunity, was developed by the participating school district steering committee comprising education leaders and practitioners. The committee included instructional coaches, lead mentors, and the professional learning team from 2014 through 2017. The peer-to-peer e-learning was designed to more quickly, efficiently, and effectively improve the professional practices of first-year teachers. The peer-to-peer e-learning model is an embedded, continuous, professional e-learning design that allows first-year teachers to connect, collaborate, and learn from each other. This intervention was both efficient and cost-effective because it had no instructors and required minimal time outside the classroom by participants.

Methodology

The methodology section includes the critical components of this study. More specifically, population selection, sampling, intervention, use of archival data, instrumentation, and operationalization of constructs, and data analysis plan will be addressed in this section.

Population

This study included the entire population of first-year teachers over a 2-year period who were teaching in the participating school district. Participants included all first-year teachers who were pursuing a state-certified professional teaching license. There were 28 first-year PreK–12 teachers (2017–2018) in the experimental group, each of whom received peer-to-peer e-learning throughout the school year. There were 32 PreK–12 teachers (2016–2017) in the control group who did not receive similar training.

Sampling and Sampling Procedures

Targeted sampling was used in this study. The sample frame included all first-year teachers in 2016–2017 and all first-year teachers in 2017–2018. The experimental group was comprised of all first-year teachers (2017–2018) who received peer-to-peer e-learning throughout the school year. The experimental group (n = 28) comprised all first-year teachers who completed all Year 1 induction requirements, including peer-to-peer e-learning, and had teacher quality standard scores recorded in the district teacher evaluation system. The control group (n = 32) comprised all first-year teachers (2016–2017) who completed year one of induction, did not have similar training to the experimental group, and had Teacher Quality Standard scores recorded in the district evaluation system.

The control group had 32 participants, and the experimental group had 28 participants. A G*power analysis with a power standard of .80 and an alpha level of 5% revealed that a minimum of 63 participants is desired for each group (Heine, 2014). The

sample size for the control group (n = 32) and experimental group (n = 28) are considered small. The small group sizes result in a low power study. Studies with low power can lead to Type II errors. There is an inverse relationship between power and committing a Type II. For example, as power decreases, the probability of committing a Type II error increases. Therefore, the low power rating for this study increases the risks of committing a type-2 error. A Type II error results in a false negative, which leads researchers into accepting a false null hypothesis. Another way to think about this is, a false negative is failing to accept an alternative hypothesis. In this case, a false negative concludes that there was no relationship between peer-to-peer e-learning and increased professional practices of first-year teachers when, perhaps, there was a relationship.

Procedures for Recruitment, Participation, and Data Collection

This study included only first-year teachers who completed Year 1 induction and had teacher evaluation data recorded. Not every first-year teacher completed the first year of induction. First-year teachers had the option to not participate in induction, and some first-year teachers did not complete all their requirements.

Participants. The initial estimate of the control group participant pool was 45. The control group, however, had several first-year teachers who did not meet participant selection requirements, leaving only 32 candidates that met the participant selection requirements. The experimental group had 10 first-year teachers who did not meet participant selection requirements, leaving only 28 first-year teachers who did meet participant selection requirements. I requested and obtained Teacher Quality Standard II, III, and IV scores for both groups. Teacher

Quality Standard scores were collected by building administrators who used the State Model Evaluation instrument to collect these data.

Informed Consent. Informed consent was not required because this study is considered exempt research (Office for Human Research Protections, 2019). This research meets category 4(ii) exemption standards because this study used deidentified secondary data, which protects the identity of participants (Office for Human Research Protections, 2019). Additionally, Institutional Review Boards, informed by the Code of Federal Regulations (CFR), do not require informed consent from participants for education studies that use deidentified archival data (Taube & Burkhardt, 1997).

Data Collection. The archival data for this study was a product of teachers' evaluations performed by building administrators. Building administrators compared teacher professional practices against Teacher Quality Standards. Teachers received Teacher Quality Standard scores, one for each Teacher Quality Standard. Teacher Quality Standards I-V measure professional practices, and Teacher Quality Standard VI measures student learning outcomes (State Department of Education, n.d.). Every year, school districts in this State are required to submit educator effectiveness ratings to the State Department of Education. An educator's effectiveness score is equally weighted between student learning outcomes (50%) and Teacher Quality Standard I-V scores (50%), also known as the professional practice score. The Teacher Quality Standard scores are determined through a process of direct observations by evaluators, which are typically administrators, and other artifacts

provided by the teacher. All school leaders submit teacher evaluation data for their teachers to the district human resources department. The human resource department reports professional practice scores and educator effectiveness scores to the State Department of Education each year. Only Teacher Quality Standard II, III, and IV scores reported to the State Department of Education of first-year teachers from 2016–2017 and 2017–2018 were used in this study.

Participant Exit. Not every first-year teacher completed Year 1 induction. First-year teachers had the option not to participate in induction or may have chosen not to complete induction. There are many reasons a first-year teacher may not have completed Year 1 induction: (a) not returning to the school district for the second year of teaching, (b) involuntary removal from the classroom, (c) decides not to work towards a professional license, and (d) overwhelmed with a teaching assignment. During this study, not all first-year teachers completed the first year of induction.

Four first-year teachers did not complete peer-to-peer e-learning for different reasons. One teacher failed to complete the final module, one teacher was moving due to a spouse being transferred for work, and two teachers were not returning to teach in the district the following year - knowing they could not complete the two-year induction process.

Follow-up Procedure. There were no follow-up procedures. Because this was an ex post facto study and archival data were used, there was no need to follow-up. A brief of this study will be provided to the participating school district, informing them of the study results.

Intervention

Peer-to-peer e-learning for first-year teachers in the district induction program was the intervention in this study. The school district induction program added peer-to-peer e-learning in the fall of 2017. All first-year teachers in the induction program who participated in induction received peer-led e-learning professional development throughout the 2017–2018 school year. To add richness to the induction experience and to more quickly develop professional practices, senior leaders planned new induction opportunities. Leaders agreed on an embedded, continuous, purposeful professional learning experience for first-year teacher cohorts who supported, challenged, and learned from each other. The Lead Mentor Team, Learning Services Team, and Professional Learning Team worked collaboratively to design the peer-to-peer e-learning model. The researcher for this study, the Coordinator of Professional Learning, was charged with developing and managing the peer-to-peer e-learning initiative.

Intervention Administration. The introduction of peer-to-peer e-learning occurred on the first day of new teacher orientation when all first-year teachers reported for orientation and training. One breakout session at the new teacher orientation focused on the induction process, where leaders explained expectations for induction and peer-to-peer e-learning. First-year teachers were shown the peer-to-peer e-learning process and were provided insight into peer-to-peer e-learning. First-year teachers received training on the district learning management system, used to deliver and facilitate peer-to-peer e-learning.

Intervention Program. The yearlong peer-to-peer e-learning intervention had four modules. Each module lasted one quarter of the school year and the peer-to-peer e-learning modules aligned with the school calendar. Each module had a specific professional learning focus. The e-learning design for all four e-learning units was similar. However, the instructional topic and cohort groupings of first-year teachers varied each quarter. The training focus by quarter can be seen in Table 1.

Table 1

Training Focus by Quarter

Quarter	Teacher Quality Standards	Element Name
1	TQS II	Classroom Management
2	TQS II	Student Agency
3	TQS III	Effective Instruction
4	TQS IV	Reflect on Practice

The peer-to-peer e-learning framework followed Lewin's action research model. The sequence of engagement for peer-to-peer e-learning instruction and activities were considered the "sequencing of events" based on the steps and process of action research (Stavredes & Herder, 2014, p. 72). The Lewin Action Research Model is a process or cycle that applies the following actions steps: plan, act, observe, and reflect (Rose, Spinks, & Canhoto, 2014). Students were required to communicate and collaborate with e-learning community peers in the engagement framework to develop professional learning plans and timelines around the learning outcomes for each unit. The learning plan and course structure were built on the tenets of student engagement

instructional strategies. First-year teachers acted on their learning plans and applied new instructional strategies in their classroom while observing student behaviors, changes, and other notable occurrences. Each quarter, after sharing their learned experiences through a collaborative capstone project, students reported on their experiences in a reflective paper. The peer-to-peer e-learning model phases were as follows:

- Phase 1 Plan
- Phase 2 Research
- Phase 3 Apply
- Phase 4 Collaborate
- Phase 5 Reflect

Several theories informed the peer-to-peer e-learning model. The major theories informing the peer-to-peer e-learning model included adult learning theory (Knowles), social learning theory (Vygotsky), experiential learning theory (Kolb), community of inquiry (Garrison), transformational learning theory (Mezirow), community of practice (Lave & Wenger), and transactional distance theory (Moore).

Quarter 1. The focus in quarter one was Teacher Quality Standard II, which addressed a safe, inclusive, and respectful learning environment (State Department of Education, n.d.). Within Teacher Quality Standard II, teachers focused on the classroom management element. Leaders placed first-year teachers into small cohorts of approximately five members. The cohorts were a mix of elementary and secondary teachers. First-year teachers were encouraged to consult with building leaders, master teachers, lead mentors, and others in their building to align their

classroom management strategy selection with any current philosophies, practices, or programs that may have already been in place. For example, if a school practiced Love and Logic, then the first-year teacher was asked to find a strategy aligned with the philosophies or practices of Love and Logic. The completion rate for quarter one module was 100%, with 48% completing their work on time.

Quarter 2. The focus in quarter two was also on Teacher Quality Standard II, which addressed a safe, inclusive, and respectful learning environment (State Department of Education, n.d.). Teachers incorporated student agency into lesson designs to provide a more personalized learning approach for their students. First-year teachers were also afforded some teacher agency and could request changes to cohort groupings. In quarter two, there was a variety of cohort mixings. Some cohorts were elementary teachers only, some were elementary and secondary teachers, and other cohorts were school-based first-year teacher groups. The completion rate for quarter two module was 100%, with 79% completing their work on time.

Quarter 3. The focus in quarter three was Teacher Quality Standard III. First-year teachers analyzed Teacher Quality Standard III, which addressed effective instruction and focused on one element in that standard related to instructional practice (State Department of Education, n.d.). First-year teachers were given more agency in quarter three and were asked to choose any single element in Teacher Quality Standard III on which they were focusing their instruction. The cohort groups changed only slightly from quarter two to quarter three. Cohort groups were

either all elementary or all secondary teachers. Two cohort groups were first-year teachers from the same school. The completion rate for the module in quarter three was 98%, with 88% completing their work on time.

Quarter 4. The focus in quarter four was on Teacher Quality Standard IV, which addressed teachers reflecting on their practice (State Department of Education, n.d.). There were no changes to cohort groupings, and the learning program did not use the Lewin Action Research model for this module. Teachers, instead, were instructed to read Teacher Quality Standard IV and reflect on their professional practices for quarters one through three. First-year teachers used what they learned throughout the school year to reflect on their practice and make professional learning goals for the upcoming school year. The completion rate for the module in quarter four was 90%, with 79% completing their work on time. Peer-to-peer e-learning successfully ended on May 1, 2018.

Archival Data

Deidentified archival data were used in this study. The archival data were Teacher Quality Standards II, III, and IV scores (see Appendix C) for every first-year teacher (2016–2018) who completed Year 1 induction. Teacher quality standard scores were used because they are the best available measure of professional practice and teaching skills. This study included no other demographic data and facilitated no follow-up intervention.

Permission and Access. The participating school district and Walden University required approval before collecting and analyzing data. The participating school district

issued permission to research on March 26, 2018 (see Appendix A). Walden University IRB approved data collection on January 30, 2019. The Walden University IRB approval number for this study was 01-30-19-0653843. Data were requested from the participating school district after receiving approval from the Walden University Institutional Review Board. The school district provided deidentified data via spreadsheets.

Instrumentation and Operationalization of Constructs

The independent variable in this study was the level of training. This was a nominal variable with two categories: (a) peer-to-peer e-learning (n = 28) or (b) no peer-to-peer e-learning (n = 32). The dependent variable in this study was interval data and was continuous. The dependent data were aggregate scores from Teacher Quality Standards II, III, and IV.

State Model Evaluation. The State Model Evaluation was the instrument used to collect and calculate Teacher Quality Standard scores. Following the passage of State Senate Bill 10-191 in 2010, the State Department of Education developed the State Model Evaluation. All State associated schools and districts were permitted to use this instrument. Senate Bill 10-191 required that this tool and related resources be made available to schools and districts to realize the State's vision for educator effectiveness (State Department of Education, n.d., p. 345) (see Appendix B). The State Model Evaluation instrument was used in this study because it was the best available instrument to measure professional practices and answer the research question.

Instrument Reliability and Validity. From the 2011–2012 school year through the 2015–2016 school year, the State Department of Education piloted the State Model Evaluation instrument in 23 school districts across the State. The results were used to complete a validation study and to improve the model. State Department of Education used seven research questions to determine the degree of validity of the evaluation model. One question, in particular, asked, "Does the distribution of professional practice ratings allow for teacher growth to be measured" (Williams & Perrin, 2015, p. v, para. 4)? The findings showed that teachers increased professional practice ratings (35%) by one or more levels, while only a small portion of the sample decreased by one or more rating levels (11.21%) (Williams & Perrin, 2015, p. v). These findings are a strong indication that this instrument can measure differences in professional practices. The internal consistency, as measured by Chronbach's alpha by evaluator ratings, was 0.94 compared to the teacher self-assessment rating of 0.87 (Williams & Perrin, 2015, p. vi-vii). Chronbach's alpha scores between 0.65 and 0.80 are considered acceptable for human dimension research (Vaske et al., 2017, p. 165). A Chronbach's alpha greater than 0.90 is considered to provide excellent reliability (Williams & Perrin, 2015, p. v). Based on the findings, the State Model Evaluation instrument used in this study is considered to provide excellent reliability and produce valid results.

Operationalization of Variables. Teacher Quality Standard scores were derived from teachers' points in the State Model Evaluation rubric through demonstration of professional practices during observations or by various artifacts shared by the teacher with the evaluator. The State Model Evaluation system

includes five of six Teacher Quality Standards (I-V) to determine teachers' professional practice scores. These five Teacher Quality Standards are comprised of 27 elements (see Appendix C). Teacher Quality Standard VI score is tied to student outcomes and is not used to calculate the overall professional practice score. For this reason, Teacher Quality Standard VI scores were not relevant to this study and were not used.

Scoring professional practice for one Teacher Quality Standard can be calculated on a 4-point scale or a 540-point scale. On a 4-point scale, a teacher could earn a score of 0 to 4 for each Teacher Quality Standard. On a 540-point scale, a teacher could earn up to 20 points per element (27 elements) for a maximum of 540 professional practice points. The State Model Evaluation system used cut scores on a 4-point scale to reflect professional practice performance level: 0.00-0.99 (basic), 1.00-1.99 (partially proficient), 2.00-2.99 (proficient), 3.00-3.99 (accomplished), and of 4.00 (exemplary). Performance levels could also follow a 540-point scale: 0-54 (basic), 55-189 (partially proficient), 190-324 (proficient), 325-459 (accomplished), and 460-540 (exemplary). Each Teacher Quality Standards had a varying number of elements, so the scoring formula below was used to weight the scoring for each standard.

1. The weight assigned for the standard times the number of standards - This ensured that the district’s used weighting, but also that the net result of weighting was 1.00 or 100 percent.

2. Total points earned for the standard divided by the total points it was possible to earn for the standard - This calculation determined the percentage of points the teacher earned for the standard.
3. The number of points possible for an individual rating - This calculation ensured that the number of points earned for the standard was on the 4-point scale used to determine ratings for individual standards and the overall professional practice rating.
4. Multiplying items 1 through 3 resulted in the contribution of the standard to the overall professional practice rating (State Department of Education, n.d., p. 44).

As shown, calculations for weighted Teacher Quality Standard Scores were divided and displayed into four parts.

Data Analysis Plan

A one-way ANOVA, which can be used to determine if the means of two or more groups were not equal (Hesamian, n.d.), was initially chosen to answer the research question. After discovering that the data were not normally distributed, a nonparametric statistic (Mann-Whitney U) was used. The Mann-Whitney U statistic was calculated to determine if the differences in each set of Teacher Quality Standard scores between the dependent and independent groups were significant.

Archival teacher evaluation data, also known as secondary data, were used to answer the research question. Using secondary data, controlling for confounding variables, covariates, and sample size are all inherent limitations in this study. The

main advantages of using secondary data are the consistency of data collection and data accessibility. The main disadvantage of using secondary source data is the lack of control over the quality of the data (Allen, 2017). For all first-year teachers in this study, the secondary data that was used and analyzed were for Teacher Quality Standards II, III, and IV.

Screening and Analyzing the Data. Data were checked for completeness, inconsistencies, missing data, or data that falls outside normal scoring limits. Statistical Package for Social Sciences (SPSS) Version 25 (IBM 2018) was used to compute descriptive statistics, ANOVA assumptions, Mann-Whitney U assumptions, Mann-Whitney U tests, and more. Ensuring that the data were screened, cleaned, and analyzed were critical steps for answering the research question accurately.

RQ1. What is the difference in three Teacher Quality Standard mean scores, as measured by the State Model Evaluation instrument, of first-year teachers trained in peer-to-peer e-learning to those who did not receive similar training?

$H_0$1: There is no statistically significant difference in Teacher Quality Standard mean scores (i.e., classroom environment, effective instruction, and reflection on practice) between first-year teachers trained in peer-to-peer e-learning to those who did not receive similar training.

H_a1**:** There is a statistically significant difference in Teacher Quality Standard mean scores (i.e., classroom environment, effective instruction, and reflection on practice) between first-year teachers trained in peer-to-peer e-learning to those who did not receive similar training.

Statistical Tests. The initial plan was to use a one-way ANOVA to answer the research question. The one-way ANOVA is a reliable statistical test that can analyze differences between the Teacher Quality Standard means of the dependent and independent groups (Hesamian, n.d.). However, six assumptions must be met for the results of an ANOVA to be considered reliable (Laerd Statistics, 2017). The data did not meet the assumption of normality as measured by Shapiro-Wilks and had numerous outlier data points. Because the assumption for normality and outlier data points were not met, a Mann-Whitney U was used in place of a one-way ANOVA. A Mann-Whitney U is a nonparametric statistical test that can analyze the mean difference between two independent groups when the dependent group data are continuous (Laerd Statistics, 2017). This test is not as reliable as ANOVA and reduces the overall power of the study (Laerd Statistics, 2017). The Mann-Whitney requires four assumptions to be met. All four assumptions were met. The Mann-Whitney U was used to analyze the variance of Teacher Quality Standard scores between independent groups of first-year teachers who participated in peer-to-peer e-learning and first-year teachers who did not participate in similar training (Frankfort-Nachmias & Leon-Guerrero, 2015). The results of the Mann-Whitney U are able to show statistically significant differences ($p > 0.05$) between Teacher Quality Standard scores.

Threats to Validity

The overall quality of quantitative research relies on the validity and reliability of the findings in this study. Many factors can adversely influence or threaten the internal and external validity of the research (Babbie, 2017). For

research study findings to be sufficiently valid, researchers must clearly and thoroughly explain strategies used to address potential threats to validity. Frankfort-Nachmias and Leon-Guerrero (2015) and Lambert (2012) describe validity as the extent to which a measurement instrument measured what it intended to measure. Burkholder et al. (2016), on the other hand, describes validity as the degree to which study findings "reflect the actual phenomenon" (p. 103). An essential question in research is who decides what is considered valid and what is not considered valid.

Validity is dependent on the assumptions and agreements we make as social scientists around the use of terms and the concepts they represented (Babbie, 2017, p. 154). For example, the State Department of Education developed the State Model of Evaluation for teachers, which has been in implementation since 2013. In that model, the State Department of Education defined six Teacher Quality Standards used to evaluate educator effectiveness. Teacher Quality Standards I-V are measures of professional practice, while Teacher Quality Standard VI are measures of student learning outcomes.

External Validity. External validity, also known as generalizability, is the degree to which the findings of a quantitative study hold across other, broader contexts (Burkholder et al., 2016, p. 117). Possible threats to external validity in most studies include sampling bias, setting, treatment, research design, and outcome measures (Frey, 2018). As a product of research design, sampling bias may occur when participants were not selected randomly (Babbie, 2017; Burkholder et al., 2016). A quasi-experimental design was used to address possible research design and

selection bias threats to external validity. The quasi-experimental design can be used by researchers when participants cannot be selected randomly (Burkholder et al., 2016). Using random selection for the sampling frame was not possible since archival data were used, and the event had already occurred. Non-random selection of participants can lead to a sample that is "not typical or representative of the larger population" (Babbie, 2017, p. 200). The sample frame for this study included all first-year teachers. Controlling for sampling and research design may have increased external validity and improved the case for generalizability (Burkholder et al., 2016). Moreover, including all first-year teachers in a large school district in the study may have increased the probability that the findings are more generalizable to other first-year teachers in similar settings.

The outcome measures collected for analysis for this study are archival teacher evaluation data that came from a secondary data source. The advantages of using secondary source data are accessibility (Allen, 2017) and the consistency of how it is collected. The disadvantage of using secondary source data is the lack of control over the quality of the data (Allen, 2017). Using secondary data can affect external validity. Administrators who were trained yearly in teacher evaluation best practices collected outcome data from observations, conversations, and work product using the State Model Evaluation instrument. Teacher evaluation data were collected throughout the school year to improve teaching and to report teacher effectiveness scores to the State Department of Education. This process's inherent nature allowed

for observer bias and other inconsistencies, which may have impacted external validity.

The setting was also a factor that affected external validity and affected the generalizable ability of results. For example, study participants may have performed differently if they knew they were being studied. Frey (2018) suggested that researchers engage participants in studies in a way that was similar to the real world. In regards to this ex post facto design, study participants were not aware they were being studied, and they were engaging in real-time professional learning vis-à-vis peer-to-peer e-learning. These conditions reduced, if not eliminated, setting threats to external validity.

External validity questions related to selection bias, research design, and setting have been addressed and reduced. While a classical, experimental design would generate higher external and internal validity, education studies are often limited to quasi-experimental designs as with this study. This study addressed selection bias by including all first-year teachers in the experimental group and the control group. Despite the attempts to reduce external validity, the findings from this study should only be generalizable to first-year teachers in Year 1 of a similar two-year induction program.

Internal Validity. How close the measurements collected in a study reflect the intended metric describes internal validity (Heale & Twycross, 2015; Lambert, 2012). The degree to which a causal relationship can be found between the independent variable and the dependent variable of a study is also quantified by

internal validity (Burkholder et al., 2016). The measurement proposed for this study were specific Teacher Quality Standard scores as measured by the State Model Evaluation instrument. Statistical analyses of these archival data from teacher evaluations were performed to determine statistical differences between the control group and experimental group scores.

Internal validity is threatened by many factors. Burkholder et al. (2016, p. 114) defined nine categories of threats to internal validity:

- history
- maturation
- testing
- instrumentation
- statistical regression to the mean
- researcher bias
- selection
- attrition
- differential mortality (Burkholder et al., 2016, p. 114)

Any combination of these factors or threats can weaken the case for research validity. Some of the foreseeable threats to internal validity for this study include (a) the use of a secondary data source instead of collecting data directly (Babbie, 2017), (b) the low number of participants in the study (selection), (c) additional professional development received (history), (d) quality of mentoring and instructional coaching (history), (e) first-year teacher's relationship with leadership, and (f) other new

programs implemented during the school year at various schools. Threats to internal validity were considered and addressed.

The State Model Evaluation instrument was used to measure Teacher Quality Standard scores. This instrument is the best instrument available to measure the professional practices and teaching skills of educators. The State Department of Education piloted the State Model Evaluation instrument with 23 school districts across the State. The results of the study were used to improve the model and to complete a validation study. As a result of the study findings, researchers determined that this instrument effectively and reliably measures changes in professional practices. The internal consistency, as measured by Chronbach's alpha by evaluator ratings, was 0.94 (Williams & Perrin, 2015, p. vi-vii). A Chronbach's alpha scores between 0.65 and 0.80 are considered acceptable for human dimension research (Vaske, Beaman, & Sponarski, 2017, p. 165), while Chronbach's alpha scores higher than 0.90 are considered excellent reliability (Williams & Perrin, 2015, p. v). With a Chronbach's alpha of 0.94, the State Model Evaluation System has excellent reliability.

Construct and Statistical Validity. Construct validity is "the degree to which a measure relates to other variables as expected within a system of theoretical relationships" (Babbie, 2017, p. 153). The State Model Evaluation for teachers was used to measure Teacher Quality Standard scores. At the time of this study, this instrument was the most widely accepted tool available to administrators to measure Teacher Quality Standard scores and professional practices. The greatest threat to construct validity was the inability to control for various confounding variables.

Possible confounding variables on Teacher Quality Standard scores included (a) independent study courses, (b) professional development provided, (c) social interactions with other teachers, (d) leadership styles of administrators, (e) the impact of instructional coaches, (f) the contribution of lead mentors during induction, and (g) more.

Two errors can occur during the statistical analysis of the data, which can threaten statistical conclusion analysis. A type-one error can occur if there was an errant conclusion around the relationship between two variables that leads to the rejection of a true null hypothesis, when there was a no actual relationship between the two variables (Frankfort-Nachmias & Leon-Guerrero, 2015, p. 277; Validity-Statistics Solutions, 2017). "A type-two error can occur when a false null hypothesis has failed to be rejected" (Frankfort-Nachmias & Leon-Guerrero, 2015, p. 277; Validity-Statistics Solutions, 2017). Error types related to this study will be discussed in greater detail in chapter 5.

Ethical Procedures

As the Coordinator of Professional Learning for the participating school district, I managed and coordinated the peer-to-peer e-learning program used in this study. I also coordinated district-wide professional learning, both face-to-face and online. In my leadership role, I worked closely with other leaders, instructional coaches, and lead mentors to launch peer-to-peer e-learning for first-year teachers in the fall of 2017. District leaders charged me with developing, onboarding, communicating, and managing

peer-to-peer e-learning throughout the school year. Throughout this study, I made a special effort to avoid conflicts of interest and researcher bias.

Treatment of Participants. The school district approved the request to conduct this study and permission to use first-year Teacher Quality Standard scores II, III, and IV (see Appendix A). Walden University approved research before gathering data. The secondary data used was deidentified. A participation consent letter was not requested because the project used unidentifiable secondary data for which consent is not required (Office for Human Research Protections, 2019).

Treatment of Data. Upon approval by Walden University IRB, the Director of Human Resources from the participating school district provided data in a digital file via email. The data I received was deidentified and did not contain personally identifiable information. This data will be in my possession on a flash storage device and stored in a safety deposit box for five years following the completion of this study. The data and storage device will be destroyed five years after this study is completed.

Summary

The methodology, research design, participant selection, data analysis plan, threats to validity, ethical treatment of participants, and ethical treatment of data were discussed in this chapter. A quasi-experimental design was used to determine if there was a difference between the professional practices of first-year teachers trained with peer-to-peer e-learning and first-year teachers not trained with peer-to-peer e-learning. The dependent variables (Teacher Quality Standard scores) and

independent variables (training levels) were operationalized. The intervention, peer-to-peer e-learning, as well as the State Model Evaluation instrument, were described in detail. Threats to validity were considered, and suggestions were provided to limit the threats to validity. Ethical treatment considerations and a description of the researcher's role in this study were also explained. Statistical analysis of the data and explanation of the results will follow in Chapter 4.

Chapter 4: Results

The purpose of this quasi-experimental study was to determine if participating in peer-to-peer e-learning improves the professional practices of first-year teachers as measured by Teacher Quality Standard scores. Only one research question was studied. The focus of the research question was the impact of peer-to-peer e-learning on Teacher Quality Standard scores of first-year teachers. As stated in the alternative hypothesis, peer-to-peer e-learning would have a statistically significant impact on professional practices of first-year teachers as measured by Teacher Quality Standard scores.

The research results and statistical analysis will be addressed in Chapter 4. The study setting, data collection, preparations, and treatment fidelity will also be described in this chapter.

Data Collection

Deidentified archival data were used in this study. The data were aggregate Teacher Quality Standard II, III, and IV scores for first-year teachers (2016–2018) who completed Year 1 of a 2-year district-sponsored induction program. The Teacher Quality Standard II, III, and IV scores were the summation of continuous observations throughout the school year. The Teacher Quality Standard scores received from the participating school district were rounded to the nearest whole number and ranged from 0 to 5. No other demographic data were used.

Timeline and Participation Rate

In February (2019), I requested data from the participating school district. This data was collected and recorded using the State Model Evaluation instrument during the

2016–2017 and 2017–2018 school years. After screening first-year teacher candidates, a total of 60 first-year teachers qualified for this study. This study included no data from participants who dropped out of the district-sponsored induction program and no data from participants who lacked Teacher Quality Standard II, III, and IV scores. The statistical analyses involved all qualifying participant scores. The data set had no scores removed.

Control Group. The control group was composed of 32 first-year teachers (2016–2017) who completed all the requirements of Year 1 of the district-sponsored induction program and had Teacher Quality Standard scores recorded in the district evaluation system. The control group pool initially had 45 first-year teachers. However, after evaluating induction completion records and evaluation data records, only 32 participants met the following study inclusion criteria: (a) being first-year teachers who completed Year 1 of induction and (b) had Teacher Quality Standard scores recorded in the school district's evaluation system.

Experimental Group. The experimental group included 28 first-year teachers (2017–2018) who completed all the requirements of Year 1 of the district-sponsored induction program and had Teacher Quality Standard scores recorded in the district evaluation system. Initially, there were 38 first-year teacher participant candidates. After evaluating induction completion as well as evaluation data records, only 28 participants met the study inclusion criteria. Inclusion criteria included (a) first-year teachers who completed Year 1 of induction and (b) had Teacher Quality Standard

scores recorded in the school district's evaluation system. See experimental and control group participation data in Table 2.

Table 2

Experimental and Control Group Participation

Number of Participants	Experimental Group	Control Group
N	28	32

G*Power Analysis. When applying ANOVA analysis, a minimum of 63 participants is recommended per group to obtain a 0.80 power rating at an alpha level of 5% (Heine, 2014). Applying a G*power analysis (Heine, 2014) using a power calculation of .80 and an alpha level of 5%, resulted in a medium power rating (0.52) for the control group ($n = 32$) as well as a medium power rating (0.47) for the experimental group ($n = 28$). The small sample sizes ($n = 32$ and $n = 28$) reduces the overall power of this study. A low power rating elevates the risks of committing a type-2 error, known as a false negative. A false negative is failing to accept an alternative hypothesis. A false negative lead to the conclusion that there is no relationship between peer-to-peer e-learning and increased professional practices of first-year teachers even though a relationship may exist.

Treatment Fidelity

Peer-to-peer e-learning was added to the district induction program in the fall of 2017. All first-year teachers in the district-sponsored induction program received peer-to-peer e-learning throughout the 2017–2018 school year. The peer-to-peer e-

learning design was developed through the collective efforts of the lead mentor team, learning services team, and the professional learning team. The final peer-to-peer e-learning model provided an embedded, continuous, e-learning experience for first-year teachers to improve professional practices, promote innovation in the classroom, and provide a means for first-year teachers to connect, support, and learn from each other.

The yearlong peer-to-peer e-learning intervention was divided into four modules. Each module had a specific professional learning focus. The peer-to-peer e-learning modules aligned with the district's academic calendar and each unit lasted one quarter of the school year. The instructional design of all four e-learning units was similar. As seen in Table 3, the instructional topics and completion rates varied each quarter. The peer-to-peer e-learning portion of the induction program successfully ended on May 1, 2018. No severe consequences or adverse effects occurred because the data and other information were deidentified and masked.

Table 3

Instructional Topics, Cohort Groupings, and Completion Rates

	Teacher Quality Standard	Professional Practice Standard Element	Completion Rate
Quarter 1	TQS II	Teachers establish an inclusive, safe, and respectful learning environment.	100%
Quarter 2	TQS II	Teachers establish an inclusive, safe, and respectful learning environment.	100%
Quarter 3	TQS III	Teachers plan and deliver effective instruction	98%
Quarter 4	TQS IV	Teachers reflect on their practice	90%

Results

In this study, there were 60 total participants. The experimental group had 28 first-year teachers, and the historical control group had 32 first-year teachers. The Teacher Quality Standard II score for the experimental group ($M = 2.82$, $SD = .905$) was higher than scores for the control group ($M = 2.56$, $SD = 1.105$). The Teacher Quality Standard III score was slightly higher in the experimental group ($M = 2.93$, $SD = .858$) than the control group ($M = 2.91$, $SD = 1.228$). The Teacher Quality Standard IV score was higher in the experimental group ($M = 2.82$, $SD = .905$) than the control group ($M = 2.69$, $SD = 1.203$). In all cases, the experimental Teacher Quality Standard mean scores were higher than the control Teacher Quality Standard mean scores. The next section will explain how significance was determined and if there were significant differences between experimental and control group scores.

A Mann-Whitney U statistical analysis was used to answer the research question and to determine statistical significance. A Mann-Whitney U is a nonparametric statistical test that can analyze the mean difference between two independent groups when the dependent group data are continuous (Laerd Statistics, 2017). In this study, the Teacher Quality Standard score means variances between first-year teachers who participated in peer-to-peer e-learning (dependent group) and first-year teachers who did not participate in similar training (independent group) (Frankfort-Nachmias & Leon-Guerrero, 2015) was analyzed using the Mann-Whitney U test. The Mann-Whitney U was used instead of the one-way ANOVA because the assumption for normality, required for an ANOVA, could not be met. The next section includes more information about the assumptions required by ANOVA analysis and why this statistical test was rejected and replaced by the Mann-Whitney U test.

ANOVA Assumptions

There are six assumptions required for ANOVA results to be considered reliable. The assumptions are as follows: (a) there is a single, continuous dependent variable, (b) there is one independent variable that was categorical with two or more independent groups, (c) there is independence of observations of the dependent group and independent group, (d) dependent variable data distribution is normal, (e) there are no significant outliers in the dependent variable, and (f) the dependent variable data demonstrate homogeneity of variances (Laerd Statistics, 2017).

All assumptions for the one-way ANOVA were met except for normality and outlier data. The assumption of normality is mandatory for reliable ANOVA (Laerd

Statistics, 2017). The process I followed to determine if there was normal distribution of dependent variable data is explained in the next section.

Assumption of Normality. The assumption of normality is met if the population is normally distributed (Frankfort-Nachmias & Leon-Guerrero, 2015). After multiple analyses, the assumption of normality was not met. Visual inspection, kurtosis, skewness, and Shapiro-Wilk tests were used to analyze data distribution. Visual inspection results weakly support normal distribution. Skewness results show that each dependent dataset is negatively skewed, and kurtosis results show peaked data distribution (leptokurtic) (Hanneman, Kposowa, & Riddle, 2012). The Shapiro-Wilk test results indicate that the dependent variable data were not normally distributed (Laerd Statistics, 2017).

Visual inspections were first used to determine if data were normally distributed. Data can be plotted on a histogram and compared to a normal distribution curve. Figures 1, 2, and 3 represent the distribution of data for all three dependent variables.

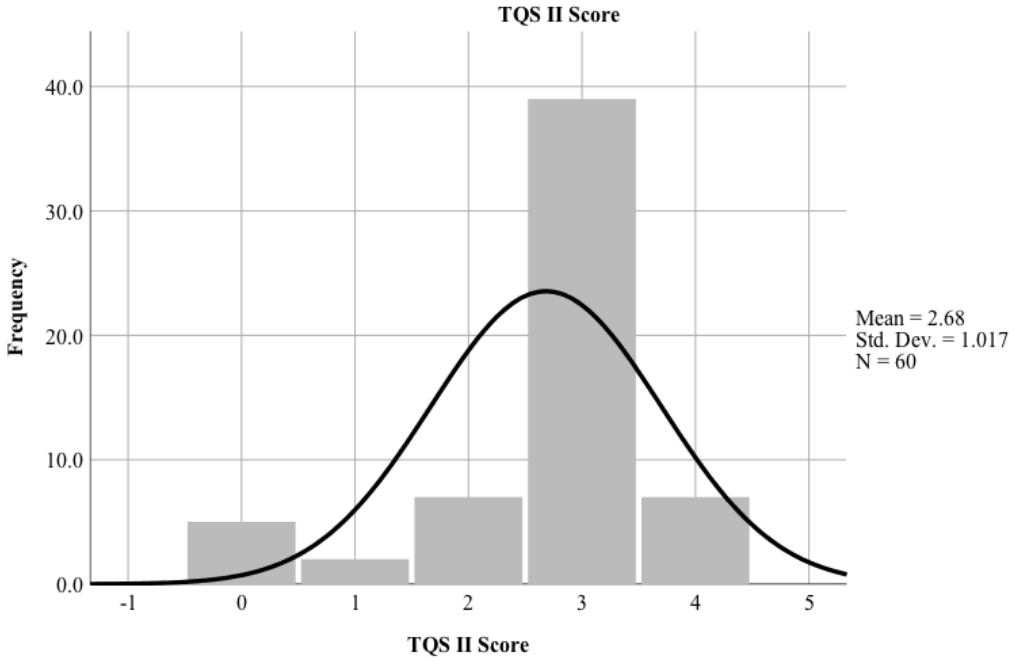

Figure 1. Teacher Quality Standard II histogram.

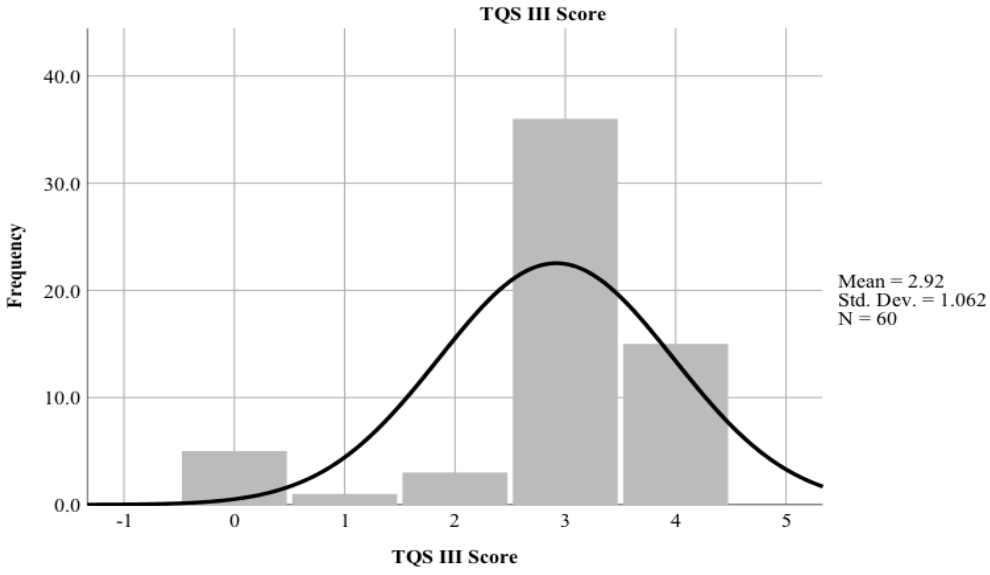

Figure 2. Teacher Quality Standard III histogram.

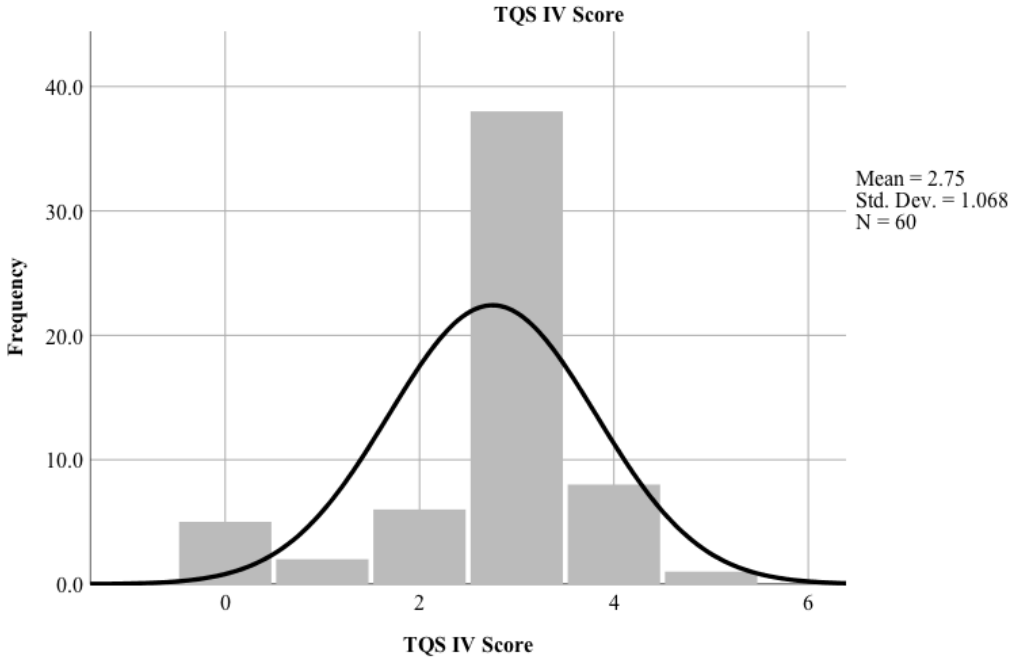

Figure 3. Teacher Quality Standard IV histogram.

Upon visual inspection, all three histograms appear to be leptokurtic curves and each chart had similar distribution shapes; albeit, different from a normal distribution.

Following the visual inspection, skewness and kurtosis tests were used to consider the data's distribution properties. Skewness results and kurtosis results can be seen in Table 4 and Table 5, respectively.

Table 4

Skewness

		Skewness	Standard Error	*z*-score
TQS II	Control	-1.47	0.41	3.59
	Experimental	-1.56	0.44	3.55
TQS III	Control	-1.60	0.41	3.90
	Experimental	-1.75	0.44	3.98
TQS IV	Control	-1.36	0.41	3.32
	Experimental	-0.92	0.44	2.09

Table 5

Kurtosis

		Kurtosis	Standard Error	*z*-score
TQS II	Control	1.58	0.81	1.95
	Experimental	3.13	0.86	3.63
TQS III	Control	1.86	0.81	2.29
	Experimental	4.80	0.86	5.58
TQS IV	Control	1.08	0.81	1.33
	Experimental	3.72	0.86	4.33

Skewness is a measure of data distribution's symmetry, while kurtosis is a measure of the data peak distribution. Data that is peaked on a distribution chart is leptokurtic and data that is flattened is platykurtic (Hanneman et al., 2012; Laerd Statistics, 2017). The kurtosis results showed that all dataset distributions were leptokurtic (peaked), which is also visually evident. All dependent dataset distributions have a negative skew. The

magnitude of skew for each dataset is within an acceptable range and supports normal distribution (Hanneman et al., 2012).

The Shapiro-Wilk was the statistical test used to assess the distribution of data for normality. Shapiro-Wilk test results are listed in Table 6.

Table 6

Shapiro-Wilk Test for Normality of Control and Experimental Groups

		Shapiro-Wilk		
	Factors	Statistic	*df*	Sig. (*p*)
TQS II Score	Control	.715	32	.000
	Experimental	.722	28	.000
TQS III Score	Control	.696	32	.000
	Experimental	.705	28	.000
TQS IV Score	Control	.731	32	.000
	Experimental	.765	28	.000

Data is considered normally distributed when *p* values are higher than 0.05 (Laerd Statistics, 2017). In testing the null hypothesis that the data follows a normal distribution, the Shapiro-Wilk test revealed $p < 0.000$ for all three sets of Teacher Quality Standard scores. As a result, the data did not follow a normal distribution. With all *p* values less than 0.05, the null hypothesis for normality was rejected, that data for Teacher Quality Standard II, III, and IV follows a normal distribution.

Effect Size. Effect size measures the impact of an intervention (Cohen, Manion, & Morrison, 2018). The intervention in this study was peer-to-peer e-learning, and this

intervention focused on three Teacher Quality Standards (II, III, and IV). Cohen's *d* was calculated for all three Teacher Quality Standards as well as combined Teacher Quality Standard scores to determine effect size. In using Cohen's *d*, an effect size less than 0.21 is considered weak (Cohen et al., 2018). Effect sizes for all Teacher Quality Standard scores were considered weak except for one. Teacher Quality Standard II exhibited an effect size of 0.26, which is considered a moderate effect (Cohen et al., 2018). See Cohen's *d* results in Table 7.

Table 7

Cohen's d Results

	TQS II	TQS III	TQS IV	Combine TQS
Cohen's *d*	0.26	0.02	0.12	0.13

Mann-Whitney Assumptions

Since the assumptions were not met for normality and outlier data points, the Mann-Whitney U was used to determine if there was a significant difference between the dependent group and the independent group data. A Mann-Whitney U is a nonparametric statistical test that analyzes the mean difference between two independent groups when the dependent group data are continuous (Laerd Statistics, 2017). In this case, the Mann-Whitney U analyzed the variance between the mean difference of Teacher Quality Standard scores.

There are four assumptions necessary to perform a reliable Mann-Whitney U calculation (Laerd Statistics, 2017): (a) Assumption one requires one dependent variable that is either ordinal level or continuous. (b) Assumption two requires that there is at

least one independent variable with two independent, categorical groups. (c) Assumption three requires independence observations. (d) Assumption four requires an analysis of score distribution for both groups of the independent variable.

All four assumptions were met. The dependent variables (Teacher Quality Standard scores) are continuous, and the one independent variable (level of training) has two independent categories (received training and did not receive training). The experimental group of first-year teachers (2017–2018) was independent of the control group of first-year teachers (2016–2017). The fourth and final assumption requires a visual inspection analysis of the distribution of dependent scores for both independent groups. Figures 4-6 were used to visually inspect and compare the shapes of graphs for the control group and the experimental group.

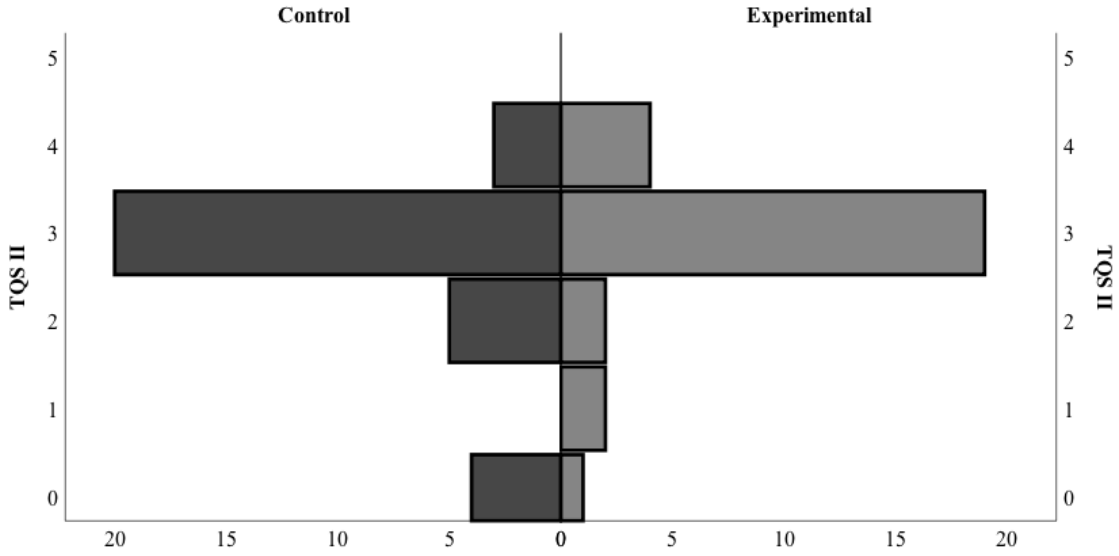

Figure 4. Data distribution comparison for Teacher Quality Standard II.

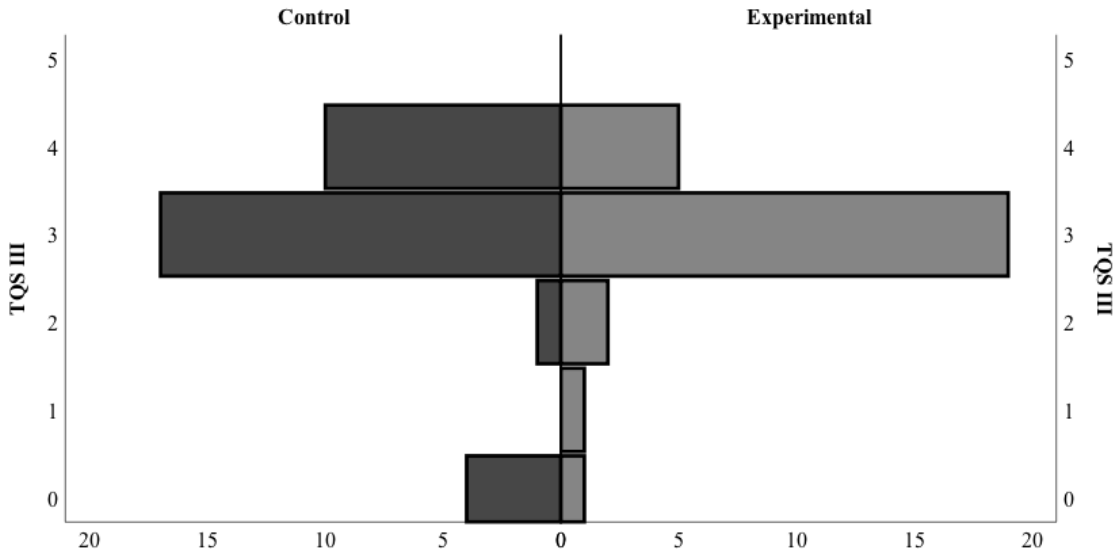

Figure 5. Data distribution comparison for Teacher Quality Standard III.

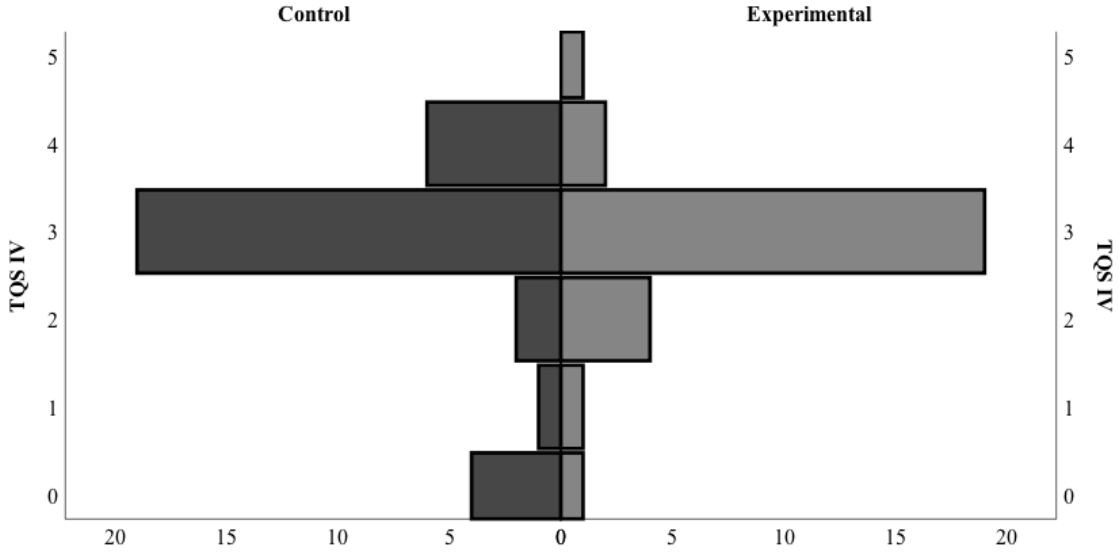

Figure 6. Data distribution comparison for Teacher Quality Standard IV.

Upon visual inspection, the distribution for all three dependent data sets is the same basic shape. The fourth assumption will assume the same shape in the final analysis of the Mann-Whitney U.

Research Question Analysis

A Mann-Whitney U test was performed on all three Teacher Quality Standard scores. The Mann-Whitney U test can determine if there are statistically significant differences between the means of two data sets that are not normally distributed. Results of the Mann-Whitney U tests can be seen in Table 8.

Mann-Whitney U Analysis

Table 8

Mann-Whitney U Test Results

	Mann-Whitney U	TS	Asymptotic Sig. (*p*)
TQS II Score	506.00	1.012	.312
TQS III Score	406.50	-0.702	.483
TQS IV Score	434.00	-0.241	.810

The alpha level for the Mann-Whitney U statistical test is 0.05. If $p < \alpha$ then there is a strong chance (95%) that there is a statistically significant difference in score means. As seen in Table 8, the *p* values for all three Teacher Quality Standards are greater than 0.05. There is no evidence to support statistically significant differences between those who had peer-to-peer e-learning for those who had no similar training in all three comparisons. Considering Teacher Quality Standard II, the *p* value of .312 suggests there is only a moderate chance (68.8%) that the differences between the control

group and experimental group scores are left to chance. The results of the Mann-Whitney U test revealed no statistically significant differences between the control group mean and the experimental group means for all three Teacher Quality Standard scores. The findings fail to reject the null hypothesis.

> RQ1. What is the difference in three Teacher Quality Standard mean scores, as measured by the State Model Evaluation instrument, of first-year teachers trained in peer-to-peer e-learning to those who did not receive similar training?
>
> $H_0$1: There is no statistically significant difference in Teacher Quality Standard mean scores (i.e., classroom environment, effective instruction, and reflection on practice) between first-year teachers trained in peer-to-peer e-learning to those who did not receive similar training in peer-to-peer e-learning.
>
> H_a1**:** There is a statistically significant difference in Teacher Quality Standard mean scores (i.e., classroom environment, effective instruction, and reflection on practice) between first-year teachers trained in peer-to-peer e-learning to those who did not receive similar training in peer-to-peer e-learning.

Statistical Findings

TQS II. The participants (n = 28) in the peer-to-peer e-learning group had an average Teacher Quality Standard II score of 2.82 (SD = 0.91) while the participants (n = 32) who did not receive peer-to-peer e-learning had an average teacher quality standard

of 2.56 (*SD* = 1.11). The overall effect of peer-to-peer e-learning on Teacher Quality Standard II was not significant. A Mann-Whitney U test was used to determine if there were significant differences in Teacher Quality Standard II scores between first-year teachers who participated in peer-to-peer e-learning to first-year teachers who did not have similar training. See Table 8 for Mann-Whitney U test results. Distributions of the Teacher Quality Standard II scores for first-year teachers who participated in peer-to-peer e-learning to first-year teachers who did not have similar training were similar, as assessed by visual inspection. The difference in mean rank for first-year teachers who participated in peer-to-peer e-learning (32.57) to first-year teachers who did not have similar training was similar (28.69) was 3.88. The median engagement score was not statistically significantly different between first-year teachers who participated in peer-to-peer e-learning (3.00) to first-year teachers who did not have similar training (3.00), U = 506.00, TS = 1.012, p = .312, using an asymptotic measure for U.

TQS III. The participants (n = 28) in the peer-to-peer e-learning group had an average Teacher Quality Standard III score of 2.93 (*SD* = 0.86). In contrast, the participants (n = 32) who did not receive peer-to-peer e-learning had an average teacher quality standard of 2.91 (*SD* = 1.23). The overall effect of peer-to-peer e-learning on Teacher Quality Standard III was not significant. A Mann-Whitney U test was used to determine if there were significant differences in Teacher Quality Standard III scores between first-year teachers who participated in peer-to-peer e-learning to first-year teachers who did not have similar training. See Table 8 for Mann-Whitney U test results. Distributions of the Teacher Quality Standard III scores for first-year teachers who

participated in peer-to-peer e-learning to first-year teachers who did not have similar training were similar, as assessed by visual inspection. The difference in mean rank for first-year teachers who participated in peer-to-peer e-learning (29.02) to first-year teachers who did not have similar training was similar (31.80) was 2.78. The median engagement score was not statistically significantly different between first-year teachers who participated in peer-to-peer e-learning (3.00) to first-year teachers who did not have similar training (3.00), $U = 406.50$, $TS = -0.702$, $p = .483$, using an asymptotic measure for U.

TQS IV. The participants ($n = 28$) in the peer-to-peer e-learning group had an average Teacher Quality Standard IV score of 2.82 ($SD = 0.91$). The participants ($n = 32$) who did not receive peer-to-peer e-learning had an average teacher quality standard of 2.69 ($SD = 1.20$). The overall effect of peer-to-peer e-learning on Teacher Quality Standard IV was not significant. A Mann-Whitney U test was used to determine if there were significant differences in Teacher Quality Standard IV scores between first-year teachers who participated in peer-to-peer e-learning to first-year teachers who did not have similar training. See Table 8 for Mann-Whitney U test results. Distributions of the Teacher Quality Standard IV scores for first-year teachers who participated in peer-to-peer e-learning to first-year teachers who did not have similar training were similar, as assessed by visual inspection. The difference in mean rank for first-year teachers who participated in peer-to-peer e-learning (30.00) to first-year teachers who did not have similar training was similar (30.94) was 0.94. The median engagement score was not statistically significantly different between first-year teachers who participated in peer-to-

peer e-learning (3.00) to first-year teachers who did not have similar training (3.00), U = 434.00, TS = -0.241, p = .810, using an asymptotic measure for U.

Summary

The data collection process and the statistical results of this study were examined in Chapter 4. Initially, an ANOVA was to be used to determine if there was a significant difference between dependent data sets. An ANOVA was not used because the assumption of normality was not met and there were numerous outlier data points. The Mann-Whitney U test, which is a nonparametric test, was used in place of an ANOVA. All four assumptions required by the Mann-Whitney U test were met. The results of the Mann-Whitney U test showed no statistically significant difference between first-year teachers who took peer-to-peer e-learning and those who did not receive similar training for all three Teacher Quality Standard scores. The results of the Mann-Whitney U test failed to reject the null hypothesis. There was no statistical evidence that peer-to-peer e-learning had a significant impact on first-year teachers' professional practices. The conclusions drawn from the study, an explanation of limitations, and recommendations for future studies will be discussed in Chapter 5.

Chapter 5: Discussion, Conclusions, and Recommendations

The impacts of peer-to-peer e-learning on the professional practices of first-year teachers were examined using a quasi-experimental design. The purpose of this study was to determine if peer-to-peer e-learning could significantly improve the professional practices of first-year teachers. This study was conducted to address the deficiency of professional practices and the skills of first-year teachers and to fill the gap in the literature around the impact of a highly autonomous peer-to-peer e-learning model on the professional development of first-year teachers. I used transactional distance theory to explain the peer-to-peer e-learning model and learning experience. Transactional distance theory is used to explain that in any learning environment, virtual, face-to-face, and blended there is a certain degree of transactional distance between learners and teachers (Moore & Diehl, 2019). Moore and Diehl (2019) asserted that this physical and psychological distance between the learner and teacher required special pedagogical considerations. Unique andragogy is needed to overcome transactional distance and high levels of learner autonomy (Moore & Diehl, 2019). This peer-to-peer e-learning model was special andragogy tested in this study. A central question in this study was whether this e-learning model could reduce transactional distance and whether first-year teachers can learn in an environment that requires high learner autonomy.

Recent studies have shown that the relationship between the teacher and learner can be an essential factor in learning, especially in e-learning (Dockter, 2016; Moore & Diehl, 2019). Challenging the concept that a teacher is necessary for e-learning of peer

cohorts, this research was conducted to analyze the impact of a teacher-less, peer-to-peer e-learning model on professional practices of first-year teachers.

The findings of this study were not statistically significant, even though the professional practice mean scores did trend in a positive direction. This positive trend in Teacher Quality Standard score means may indicate that a peer-to-peer e-learning model could evolve into a strategy that education leaders could use in other ways with first-year teachers. Overall the combined Teacher Quality Standard II, III, and IV mean scores were higher (+0.40) for teachers who participated in peer-to-peer e-learning than for those who did not participate in similar training. The increase in the overall Teacher Quality Standard means (+0.40) represented a small increase (5.04%) over the control group mean.

The impact of peer-to-peer e-learning on the professional practices of first-year teachers, as measured by three Teacher Quality Standard scores, will be discussed in Chapter 5. The study's interpretation, explanation of study limitations, recommendations for future studies, and findings implications will also be discussed in this chapter.

Interpretation of the Findings

The findings of this study were not statistically significant. The combined Teacher Quality Standard mean scores for peer-to-peer e-learning participants were higher (+0.40) than those who did not participate. The increase in professional practice scores (+0.40) was a positive difference, but there is no statistical evidence to suggest that this was nothing more than a chance occurrence. In this section, I will answer the research question and interpret what I learned about peer-to-peer e-learning of first-year

teachers. I will also explain how these findings fit within current literature and transactional distance theory.

Changes in three Teacher Quality Standard mean scores measure the professional practice differences between the control group and the experimental group. See Table 9 for details.

Table 9

Change in Teacher Quality Standard Scores

	Control Group	Experimental Group	Mean Difference	Percentage Difference
TQS II Score	2.56	2.82	+0.26	+10.1%
TQS III Score	2.91	2.93	+0.02	+0.7%
TQS IV Score	2.69	2.82	+0.13	+4.8%

All three Teacher Quality Standard mean scores increased. Teacher Quality Standard II showed the most substantial mean increase (+0.26). Teacher Quality Standard III showed the smallest mean increase (+0.02). Teacher Quality Standard IV showed the second-largest mean increase (+0.13).

Peer-to-Peer E-Learning Impact on Professional Practice

In this study, I explored the differences in three Teacher Quality Standard mean scores, as measured by the State Model Evaluation instrument, of first-year teachers trained in peer-to-peer e-learning to those who did not receive similar training. Teachers who participated in peer-to-peer e-learning (n = 28) had combined Teacher Quality Standard mean scores higher (+0.40) than those who did not participate (n = 32). The

increase in the combined Teacher Quality Standard means scores (+0.40) of the experimental group represents a small increase (+5.04%) in the overall Teacher Quality Standard mean. Teacher Quality Standard II, which received two-quarters of intervention, had the highest overall increase in professional practice (+0.26 / +10.1%).

I found no research that quantified the impact of peer-to-peer e-learning on the professional practices and teaching skills of first-year teachers. This study contributes to the current body of knowledge by revealing that a self-regulated, highly autonomous peer-to-peer e-learning model does not make a statistically significant difference in first-year teachers' professional practice outcomes.

Traditional Peer Learning. Other studies reveal that traditional peer-to-peer learning can lead to increased knowledge and achievement. Traditional peer learning, in this case, refers to face-to-face or in-person. Research supports peer group learning as an "important pedagogical practice" (Hanson et al., 2016, p. 191). Team-based learning has a positive impact on content knowledge gains (Finn & Campisi, 2015; Muller et al., 2017) compared to non-team-based learning groups (Swanson et al., 2017). Swanson et al. (2017) reported that peer learning had a moderate effect size (0.55) on content knowledge acquisition. Other researchers reported a variety of positive impacts on achievement (Dancer et al., 2015; Muller et al., 2017; van der Meer et al., 2017).

The overall impact of this study, as measured by Cohen's *d* effect size, was positive but varied by Teacher Quality Standards. Teacher Quality Standard II had the highest effect size on professional practice (Cohen's $d = 0.26$). An effect size of 0.26

moderate in magnitude (Laerd Statistics, 2017). Effect size indicates the impact of an intervention (Coe, 2002). Consider this example. If a first-year teacher scored in the middle (13th) of his or her cohort of approximately 25 peers without intervention, then an effect size of 0.26 suggests that the same student would likely score higher (10th) in the same cohort due to the intervention response (Coe, 2002). Peer-to-peer e-learning did not impact Teacher Quality Standard III (Cohen's $d = 0.02$). Teacher Quality Standard IV revealed a low effect size (Cohen's $d = 0.12$). All three effect sizes were in a positive direction, but effect sizes were small.

The number of sessions and the size of the traditional peer team may affect individual achievement within the group. Smaller teams performed better than larger teams (Swanson et al., 2017), and there was a "clear relationship" (p. 6) between the number of sessions attended and achievement. Based on these findings, the peer-to-peer cohort sizes in this study were single digits.

Participants in peer-to-peer e-learning received additional training on Teacher Quality Standard II. Coincidentally, Teacher Quality Standard II had nearly twice the effect size (Cohen's $d = 0.26$) of the other two Teacher Quality Standard scores (III and IV) effect sizes combined (Cohen's $d = 0.14$). It is not clear if the increased effect size is a function of the additional intervention. While the additional intervention and increased effect size findings were inconclusive, it may offer researchers a reason to consider future research that examines the relationship of peer-to-peer dosage and outcome. Research shows that traditional peer-learning can result in knowledge acquisition and positive student outcomes (Dancer et al., 2015; Muller et al., 2017; van der Meer et al., 2017).

However, no research that addressed online peer-to-peer outcomes of first-year teachers surfaced.

Online Peer Learning. In a qualitative study of 14 preservice teachers, Yang (2016) found that participating in peer-to-peer e-learning communities led to significantly increased professional growth of prospective teachers. In a qualitative study, Yang (2016) found that positive increases in the professional growth of prospective teachers were statistically significant. While the findings of the peer-to-peer e-learning for first-year teachers were in a positive direction, the statistical analysis was contrary to Yang's (2016) findings.

All three Teacher Quality Standard scores increased. The overall Teacher Quality Standard Score II mean difference was +0.26. The overall Teacher Quality Standard III mean difference was +0.02. The overall Teacher Quality Standard IV mean difference was +0.13. The overall increase in professional practice scores was +0.41. Findings from other studies have shown that peer-to-peer e-learning can improve educator skills and professional knowledge of prospective teachers (Bone & Edwards, 2015; Yang, 2016). There is no evidence to suggest that this peer-to-peer e-learning program is the solution to address professional practices and teaching skills of first-year teachers.

Not all researchers agree on the impact of peer-to-peer learning (Krutka et al., 2016; Stigmar, 2016; Williams & Reddy, 2016). There continues to be uncertainty around the overall effectiveness of peer-to-peer influence on learning outcomes, achievement, and a deeper understanding by peer participants of higher education (Stigmar, 2016). Evidence from this peer-to-peer e-learning study does not reduce the

extent of uncertainty around the impact of peer learning on achievement. The constructs of professional learning networks that could increase deeper and continuous learning need additional research (Krutka et al., 2016). Similarly, evidence from this study exists to show that the impact of peer-to-peer e-learning also requires further research and greater understanding.

Ekwunife-Orakwue and Teng (2014) suggested that researchers move away from a narrower approach of measuring learning perceptions and move toward measuring actual cognitive impacts. By measuring differences in Teacher Quality Standard scores, I used a quantitative approach to measure the impact of peer-to-peer e-learning on the professional practices and teaching skills of first-year teachers. Since improving professional practices using traditional professional development approaches has been proven to be difficult, researchers need to learn more about the impacts of peer-to-peer e-learning on achievement as an alternative approach to traditional professional development.

Traditional Professional Development. Conventional approaches to professional development are considered a process critical in the preparation and development of teachers (Guskey, 2009; Kennedy, 2016), but using professional development to influence educator effectiveness scores is difficult. As a result of a 2-year study, the 2015 Mirage Report suggested that education leaders need to develop innovative, embedded, continuous professional development models instead of relying on current professional development practices (Jacob & McGovern, 2015). The development of this peer-to-peer e-learning design, which was innovative, embedded,

and continuous, was influenced by some of the recommendations made in the 2015 Mirage Report. Similar to the findings from the 2015 Mirage Report, this peer-to-peer e-learning study found it challenging to make significant differences in educator outcomes. Even though there was a slight (+5.04%) movement in overall Teacher Quality Standard scores (+0.40), the results were not statistically significant. Similarly, as reported in the Mirage Report, despite the vast resources invested in professional development, there was little to no impact on teacher growth and educator effectiveness (Jacob & McGovern, 2015).

The design of the peer-to-peer e-learning model incorporated fundamental, strategic interactions between learners, such as collaboration, resource sharing, and knowledge sharing. The results of this study did not strengthen the concept that this e-learning design could lead to meaningful and impactful learning, without the presence of a teacher. As special andragogy for online courses that lack teachers, course designers should consider how to overcome the highly autonomous nature of peer-to-peer e-learning through unique interactions and though course structure and dialogue. Online course designers should consider that an engaging peer-to-peer e-learning process can increase participation (Bone & Edwards, 2015) and foster professional development (Altinay, 2017).

Autonomy Readiness. Learner autonomy readiness is one possible explanation for e-learning outcomes. Learner autonomy is the capacity of a learner to make their own learning decisions and to learn independently (Moore & Kearsley, 2012). Learner autonomy, which requires independence of learning and study habits (Huang et al.,

2015), places less responsibility on the teacher and more responsibility on the learner to achieve (Moore & Kearsley, 2012). First-year teachers may not be ready to learn in this autonomous learning environment.

The absence of a teacher in this asynchronous learning environment automatically created autonomous space (Yilmaz & Keser, 2017) for participants in this peer-to-peer model. The lack of a teacher to guide learning and the increased demand for autonomy in this asynchronous e-learning environment might indicate that first-year teachers are not prepared to learn under these conditions. Dockter (2016) explained that various aspects of distance education, such as relationships formed between teacher and other participants, interactions, communication frequency, course structure, and more could impact learner autonomy. Perhaps future peer-to-peer e-learning models should give more consideration to the variables that impact learner autonomy.

Through course design, learner autonomy can be promoted or discouraged; finding a proper balance is necessary. Szczepek-Reed (2017) noted that limiting the role of the instructor can create space for learner autonomy. In this case, eliminating the instructor or teacher may have created too much autonomous space for first-year teachers. Moore (2016) pointed out that striking a balance with learner autonomy in e-learning design was necessary but challenging. Learner autonomy can be promoted or discouraged by the course structure (Dockter, 2016), but the course instructor is primarily responsible for creating spaces for learner autonomy (Benson & Samarawickrema, 2009; Szczepek-Reed, 2017).

The amount of structure required in an online course depends on learner autonomy, and the amount of transaction distance students were willing to tolerate (Moore & Kearsley, 2012). Instructional designers can account for transactional distance tolerance in their course design by managing structure and dialogue (Andrade, 2014; Moore & Diehl, 2019). For example, students with lower levels of learner autonomy need higher levels of structure and higher levels of dialogue (Huang et al., 2016). Considering the overall insignificant differences in professional practices of first-year teachers, online course designers may want to consider learner autonomy differences in the design of future peer-to-peer e-learning models.

Limitations of the Study

The limitations of this study related to generalizability and trustworthiness will be explained in this section. Through careful research design, data collection, and analysis, researchers strive to account for and limit the variables that could unduly influence the results of a study (Burkholder et al., 2016). In education research, it can be nearly impossible to control for variables. This lack of control for variables can place numerous limitations on the findings. The limitations associated with any study, especially an education research study, can threaten the overall generalizability and trustworthiness. The limitations related to this study can be attributed to several factors. This section includes a discussion about the generalizability and trustworthiness of this study by examining the threats to internal validity, external validity, construct validity, statistical validity, reliability, and experimenter bias.

Internal Validity and Confounding Variables

How closely the measurements collected in a study reflect the intended metric describes internal validity (Heale & Twycross, 2015; Lambert, 2012). Suter (2011) explained internal validity as the degree to which a research design controls research bias and other forms of "contaminating influences" (p. 196) such as confounding variables. The most significant threats to internal validity for this study included the use of a (a) secondary data source, (b) sample size (n=60), (c) reliability of the data collection instrument, and (d) confounding variables.

Confounding variables may result in misleading relationships between dependent variables and independent variables (Burkholder et al., 2016; Cramer & Howitt, 2004). "In any study, there is potentially an infinite variety of possible confounding variables" (Cramer & Howitt, 2004, p. 36). This statement is particularly true when it comes to education research. Due to the nature of quasi-experimental research design, there are confounding variables, or factors, that cannot be controlled. The obvious confounding variables in this study include (a) variability of additional professional development taken by first-year teachers; (b) variability of in-service training; (c) instructional coaching; (d) quality of mentoring; (e) rater consistency, (f) evaluator training, (g) professional learning culture in each school, and (h) level of expectations in each school.

In the participating school district, first-year teachers were encouraged and incentivized to take additional professional development and training outside of what was required. All inductees were allowed to take as much locally provided

professional development as they desired at no cost to the inductees. The level of participation in voluntarily chosen professional development varied among first-year teachers. In-service was another form of professional learning. Schools across the participating district offer in-service training throughout the school year that vary in scope, focus, duration, and quality.

The quality of mentoring and instructional coaching also varied across the participating district and could not be controlled. All first-year teachers were paired with mentors, but not all mentors provided the same quality of mentoring for first-year teachers. The mentor-mentee interactions were a form of professional learning. The quality of mentor-mentee relationships and the level of interactions between mentors-mentees varied significantly. Across the participating school district, the presence of instructional coaches also changed from school to school. The use of instructional coaches was left up to each school to provide or not provide. Some schools provided instructional coaching, and some did not. Finally, professional learning culture, as well as the quality of instructional leadership by building leaders, could also influence first-year teachers' professional learning.

The validity of this study was impacted by other confounding variables. The confounding variables that likely had the highest impact on the relationship between the dependent variable and independent variable include (a) variability of additional professional development; (b) variability of in-service training; (c) instructional coaching; (d) quality of mentoring; and (e) professional learning culture and (f)

expectations in each school building. The threats to internal validity described in the following section speak to the trustworthiness of this study.

Secondary Data Source

Secondary data in the form of aggregate Teacher Quality Standard scores were used in this study. The scores were summary scores of multiple observations, artifacts, and work products collected over one school year. The Teacher Quality Standard scores that were reported to the State Department of Education were analyzed in this study. The advantage of using secondary source data is accessibility and the consistency of how it is collected, summarized, and reported by all schools in a large school district (Allen, 2017). The disadvantage of using secondary source data is the lack of control over the quality of the data (Allen, 2017). School districts report rounded Teacher Quality Standard scores to the State Department of Education. The rounded, aggregate data likely led to these data not distributing normally, even after applying various data transformations and adjusting for outlier data. The large proportion of summarized Teacher Quality Standard scores at or near 3.0 resulted in Leptokurtic distributions. The kurtosis values of the leptokurtic distributions were higher than normal distributions with a high peak at 3.0.

Statistical Conclusion Validity

The accuracy and reliability of statistical or analytical results from a study describe statistical conclusion validity. For this study, the threats to statistical conclusion validity were sample size and consistent application of the State Evaluation Model. The participants included all first-year teachers who completed

Year 1 of induction and who had Teacher Quality Standard scores recorded in the district database. This pool of candidates netted 32 participants in the control group and 28 participants in the experimental group. The participant sample sizes were small. Power analysis for a 0.80 power with an alpha level of 5% for an ANOVA recommends a minimum of 63 participants for each group (Heine, 2014). Power analysis using a power calculation of .80 and an alpha level of 5%, resulted in a medium power rating (0.52) for the control group (n = 32) and a medium power rating (0.47) for the experimental group (n = 28) (Heine, 2014). With a medium power rating, positive results in this study can lead to increased risks of committing a type-2 error, also known as a false negative.

Inconsistent application of the evaluation instrument was another possible threat to statistical validity. Principals must receive training each year on the proper use of the instrument (State Department of Education, 2017). Despite the annual training, there remained the possibility of inconsistent application of the State Evaluation Model by principals and other evaluators. In this study, there was no ability to control for this variable. The inconsistent application of the evaluation instrument should be considered a significant threat to statistical validity.

Two errors can occur during the statistical analysis of data, which could threaten statistical conclusion analysis. A type-one error can occur if there was an incorrect conclusion about the relationship between two variables. A type-one error could lead to the inaccurate rejection of the null hypothesis when there was no relationship between the two variables (Frankfort-Nachmias & Leon-Guerrero, 2015,

p. 277; Validity-Statistics Solutions, 2017). A type-two error can occur when a false null hypothesis has failed to be rejected (Frankfort-Nachmias & Leon-Guerrero, 2015; Validity-Statistics Solutions, 2017). Analysis of the data failed to reject the null hypothesis. There stands a risk that a type-two error (false negative) may be possible with the findings of this study. The alternative hypothesis may be rejected when it should not have been.

External Validity

The ability to generalize the findings of a study to others in the "real world" describes external validity (Babbie, 2017, p. 245). The threats to external validity in this study include sampling bias, setting, and research design. A quasi-experimental design was used in this study to address research design and selection bias. The quasi-experimental design is an approach that researchers use when participants cannot be selected randomly (Burkholder et al., 2016). Random selection was not possible due to the use of archival data. There is a risk that non-random selection of participants resulted in a sample that was "not typical or representative of the larger population" (Babbie, 2017, p. 200). A complete sample frame of all first-year teachers was used to overcome or reduce the threat of sample bias. The control group and the experimental group included all first-year teachers who participated in and completed the district-wide induction program. Controlling for sampling and research design reduced the threats that might have otherwise been present. Reducing the threats caused by research design and sample bias likely increased

external validity and improved a case for generalizability (Burkholder et al., 2016). Generalizing beyond this setting is recommended with discretion.

Recommendations

The primary purpose of this research was to understand peer-to-peer e-learning better. This study answered some questions about the peer-to-peer e-learning phenomenon, but new questions emerged. There was no statistically significant difference in Teacher Quality Standard scores. However, the peer-to-peer e-learning model showed positive trends toward improved first-year teachers' professional practices in year one of a district-wide induction program at one large school district. Based on the study limitations, strengths, and related literature, this section offered three recommendations for future research and consideration.

Disaggregate Data

My first recommendation is to extend this study by analyzing specific element scores within each Teacher Quality Standard. Teacher Quality Standard scores are aggregate data. Multiple element scores form aggregate Teacher Quality Standard scores. Each element concentrates explicitly on specific professional practice or teaching skill. This study relied on the aggregate scores collected through routine observations, work products, and evaluation using the State Evaluation Model. Accordingly, I was unable to analyze the data for specific elements within Teacher Quality Standard scores.

Consider Teacher Quality Standard II. Six elements comprise Teacher Quality Standard II. Each of the six elements was measured and used to calculate the composite or aggregate Teacher Quality Standard II score. A future study that analyzed specific

element scores might help the field understand the direct impact of peer-to-peer e-learning on professional practices of first-year teachers better.

Experimental Research Design

My second recommendation is to study the impact of peer-to-peer e-learning on first-year teachers by using an experimental research design instead of a quasi-experimental research design. Because the dependent variable was archival data, the use of a quantitative approach best attempted to answer the research. Moreover, since some researchers were calling for more studies to be conducted that looked at the quantitative differences in distance learning models, a quantitative approach was selected (Andrade, 2014; Quong et al., 2018). Quong et al. (2018) suggested that the field look into student learning outcomes through the application of more authentic engagement and used the concept of "basic sharing of resources" (p. 19) as an example of an authentically engaged learner, which became a driver for research decisions in this study.

A quasi-experimental design, which is a research design that can show relationships between variables, was used in this study. While quasi-experimental designs are not unusual in education research (Burkholder et al., 2016; Butin, 2010), an experimental research design more reliably resolves quantitative causality studies (Burkholder et al., 2016). An experimental design, which uses a random selection of participants, provides a much more persuasive argument for causal relationships between independent and dependent variables (Burkholder et al., 2016). For these reasons, researchers should consider re-examining this study using an experimental design.

Collegial Benefits

My third recommendation is to conduct a study that examines the collegial benefits of participating and in this type of e-learning model. First-year teachers find it challenging to form collegial support groups in the workplace (Aslan & Zhu, 2016). Coworker collegiality can be beneficial to new teachers (Turner & Morelli, 2017). New teachers who build strong relationships with their colleagues and other essential stakeholders often "thrive" (Turner & Morelli, 2017, p. 137) and create conditions that can improve teacher effectiveness (Kini & Podolsky, 2016). Conversely, the absence of collegial support and the lack of feeling of acceptance into the education community can lead to the attrition of early career teachers.

New teacher attrition is a persistent and costly problem in K-12 education (Bastian & Marks, 2017; Hannan et al., 2015; Vagi et al., 2017) and has led to the "greening of the teacher workforce" (Bastian & Marks, 2017, p. 360-361). The New Teacher Center reports that a recent surge of new teachers has been entering the workforce over the past few years and estimated that 427,000 first-year teachers began teaching careers in 2018 (Williams & Gillham, 2016). If recent attrition trends continue, 20 percent of these 427,000 first-year teachers will not be in the teaching workforce within three years (Hanover Report, 2017). New teachers who work closely with other new teachers build collegiality in unique ways within an e-learning environment. A study that looks at the impact of peer-to-peer e-learning on collegial relationships of first-year teachers could help the field better understand if this e-learning model could reduce new teacher attrition.

While the focus of this study was on one research question, additional questions and future research ideas emerged. In this section, I will explain the limitations of this study and provided three recommendations for future research consideration. In the future, researchers should consider measuring disaggregate data, applying other research designs, and study the collegial benefits of participating in a peer-to-peer e-learning model.

Implications

Analysis of the data suggests that peer-to-peer e-learning had no significant impact on first-year teachers' professional practices. While there was a positive trend in Teacher Quality Standard scores, nothing in the data concluded that education leaders should move forward with peer-to-peer e-learning as a professional development alternative to improve the professional practices of first-year teachers. More research is needed to understand if peer-to-peer e-learning has other educational benefits. Possible social implications, practice implications, and theoretical implications of the findings will be explained in this section. This study was limited in scope and only included first-year teachers, and the findings may or may not apply to more experienced teachers.

Positive Social Change

The findings from this study have the potential to make a positive social contribution by informing future researchers and education leaders to consider alternative approaches to improving professional practices and teaching skills of first-year teachers. We now know that the current e-learning model used in this study, as it stands, did not make a significant difference in the professional practices and teaching skills of first-year

teachers. The impact of a highly autonomous peer-to-peer e-learning model on the professional practices of first-year teachers was unknown until the completion of this study. Now, as much as ever, the challenge continues to more quickly and efficiently improve the professional practices and teaching skills of first-year teachers. Today we know not to go down this same e-learning pathway without further consideration.

With an estimated 427,000 new teachers entering the teaching profession in 2018 (Williams & Gillham, 2016), education leaders need new ways to efficiently improve the professional practice deficits of first-year teachers. First-year teachers are less skilled than experienced teachers (Grissom et al., 2015; Kini & Podolsky, 2016), creates inequity in the quality of teachers that students receive from year to year (Grissom et al., 2015). A student who is assigned a first-year teacher will not have the same achievement gains (Kini & Podolsky, 2016). The lack of professional practices and teaching skills negatively impacts student learning (Helms-Lorentz et al., 2016), and to address this inequity, education leaders have the means necessary to improve professional practices of first-year teachers efficiently. Improving the professional practices of first-year teachers leads to more effective teaching, making learning opportunities for all students more equitable.

A finding of insignificance can be just as important as a finding of significance. The Peer-to-peer e-learning model, designed to more quickly and efficiently increase the professional practices and teaching skills of first-year teachers, launched with much promise. In the end, this e-learning experience and e-learning model did not make a significant difference in the professional practices and teaching skills of first-year

teachers as measured by Teacher Quality Standard scores. Researchers and education leaders can learn from the findings of this study as they continue to search for new, innovative ways to improve professional practices and teaching skills of first-year teachers more quickly and efficiently. There will be evidence of higher student achievement when the problems of professional practice deficiencies of first-year teachers are solved.

Practice Considerations

The findings of insignificance should not completely dissuade future development and use of peer-to-peer e-learning models. There was weak evidence in the descriptive data to hint that something positive may have resulted from this e-learning experience. For example, all three Teacher Quality Standard score means increased between the control group and the variable group. Teacher Quality Standard II (+0.26) had the most substantial mean score increase. E-learning modules for quarter one and quarter two focused on different elements found in Teacher Quality Standard II. Teacher Quality Standard III (+0.02) and IV (+0.13) received one dose each and had score increases. Teacher Quality Standard II received two quarters of training compared to only one quarter of training each for Teacher Quality Standard III and IV. Teacher Quality Standard II score increased (+0.26) nearly twice as much as the Teacher Quality Standard III and IV scores combined (+0.15). The disparity in mean score differences may imply that there was a positive impact of peer-to-peer e-learning on professional practices.

The Teacher Quality Standard scores from this study show positive trends. Still, analysis of the data showed non-significant findings that peer-to-peer e-learning might be

a feasible solution to improve professional practices of first-year teachers efficiently. The results indicate that this peer-to-peer e-learning model did not significantly impact the professional practices of first-year teachers. Perhaps more research is needed to understand better the benefits peer-to-peer e-learning model provides educators. As a result of this study, education leaders and e-learning designers should consider changes to this model before using peer-to-peer e-learning to increase professional practices and teaching skills.

Theory Implications

The relationship between the distance learning design variables of dialogue, structure, and learner autonomy is explained by transactional distance theory (Moore & Kearsley, 2012). Moore and Diehl (2019) describe transactional distance as the perceived gap between the learner and teacher, was both physical and psychological, and the psychological space required special pedagogical design considerations (Moore & Diehl, 2019). Moore and Diehl (2019) also explain that dialog, structure, and autonomy influence the gap between teacher and learner. I expected that first-year teachers would learn from each other in this highly autonomous e-learning environment despite the absence of an instructor. The absence of an instructor resulted in an e-learning environment with high transactional distance, which required higher levels of learner autonomy.

Transactional distance theory is the predominating theory used to guide and inform distance education and e-learning designs. This theory explains the underlying andragogy of the peer-to-peer e-learning design used in this study. The unique

andragogy used in this peer-to-peer e-learning model was a learning space where each participant becomes a surrogate teacher among their peers by establishing themselves as subject matter experts in a variety of professional practices and teaching strategies. Yang (2016) found that preservice teachers playing the role of subject matter experts in an online feedback role increased professional knowledge and cognitive presence. He concluded that subject matter experts in discussion threads create teacher presence, improve professional practices, and increase professional knowledge of preservice teachers. A central question in this study was whether first-year teachers in a highly autonomous e-learning environment of peers could replace the need for an instructor, overcome a high degree of transactional distance, and learn from each other.

In the early years of distance learning research, Moore (1972) observed and noted that autonomous learning was variable. He recognized that independent learning, also known as autonomous learning, could range from "highly individualized" to "low individualized" (p. 79) and that instructional programs could be designed or organized in ways to accommodate the autonomous learner (p. 81). The peer-to-peer e-learning model in this study, which has no teacher, naturally created a situation that required maximum learner autonomy. The amount of structure needed in an online course is dependent on the level of learner autonomy, and the amount of transaction distance students were willing to tolerate (Moore & Diehl, 2019). Saba and Shearer (1994) found that there may be benefits in self-regulated, autonomous learner models, such as peer-to-peer e-learning, where the learner had more control in dialog and decision making. Saba and Shearer

(1994), however, point out that "a desired instructional strategy" was one where there was a balance between dialog and structure (p. 55).

Peer-to-peer e-learning can improve educator skills and knowledge of prospective teachers (Bone & Edwards, 2015; Yang, 2016), and in some cases, the improvement can be significant (Yang, 2016). Central to this study is whether first-year teachers are willing or able to tolerate increased transactional distance created in a highly autonomous e-learning model. As supported by the findings, first-year teachers may not be able to overcome the elevated levels of transactional distance and the high level of learning autonomy created by this e-learning model. Considering the variables of distance learning, this model may have lacked the balance between dialog and structure that Saba and Shearer (1994) described was needed to create an acceptable level of learner autonomy required by first-year teachers. Looking back on this e-learning experience, perhaps adding a mentor or coach to this e-learning model could have improved the learning conditions for first-year teachers by decreasing transactional distance and the demand for learner autonomy.

Conclusion

For Year 1 of a two-year induction program, one school district developed an innovative peer-to-peer e-learning model to increase the professional practices of first-year teachers. While peer-to-peer e-learning improves educator skills and knowledge of prospective teachers (Bone & Edwards, 2015; Yang, 2016), peer-to-peer e-learning and related constructs are still considered an emerging field (Lynch et al., 2014). Research revealing the impact of peer-to-peer e-learning on the professional practices of first-year

teachers did not surface. This study attempted to fill that void in the research. The findings of this study were not statistically significant. There was no significant impact of peer-to-peer e-learning on the professional practices and teaching skills of first-year teachers. There may be benefits of peer-to-peer e-learning for first-year teachers that were not revealed in this study. Continued research on peer-to-peer e-learning models for first-year teachers and other educators is a worthwhile effort for researchers.

References

Adnot, M., Dee, T., Katz, V., & Wyckoff, J. (2017). Teacher turnover, teacher quality, and student achievement in DCPS. *Educational Evaluation and Policy Analysis*, *39*(1), 54–76. doi:10.3102/0162373716663646

Allen, M. (2017). *The sage encyclopedia of communication research methods* (Vols. 1–4). Thousand Oaks, CA: SAGE Publications, Inc doi: 10.4135/9781483381411

Altinay, Z. (2017). Evaluating peer learning and assessment in online collaborative learning environments. *Behaviour & Information Technology*, *36*(3), 312–320. doi:10.1080/0144929x.2016.1232752

Andrade, M. S. (2014). Dialogue and Structure: enabling learner self–regulation in technology-enhanced learning environments. *European Educational Research Journal*, 13(5), 563–574. doi:10.2304/eerj.2014.13.5.563

Aslan, A., & Zhu, C. (2016). Influencing factors and integration of ICT into teaching practices of pre-service and starting teachers. *International Journal of Research in Education and Science*, *2*(2), 359–370. doi:10.21890/ijres.81048

Babbie, E. R. (2017). *The basics of social research*. Cengage Learning.

Bağrıacık Yılmaz, A., & Karataş, S. (2018). Development and validation of perceptions of online interaction scale. *Interactive Learning Environments*, 26(3), 337–354. doi:10.1080/10494820.2017.1333009

Bastian, K. C., & Marks, J. T. (2017). Connecting Teacher Preparation to Teacher Induction. *American Educational Research Journal*, 54(2), 360–394. doi:10.3102/0002831217690517

Bell, L., & Lygo-Baker, S. (2019). Student-centered learning: a small-scale study of a peer-learning experience in undergraduate translation classes. *The Language Learning Journal*, 1–14. doi:10.1080/09571736.2016.1278030

Benson, R., & Samarawickrema, G. (2009). Addressing the context of e-learning: using transactional distance theory to inform design. *Distance Education*, *30*(1), 5–21. doi:10.1080/01587910902845972

Bone, J., & Edwards, S. (2015). Connecting in rhizomic spaces: Peer-assisted learning (PAL) and e-learning in teacher education. *Australian Journal of Adult Learning*, *55*(1), 54. Retrieved from https://www.ajal.net.au

Bowsher, A., Sparks, D., & Hoyer, K. M. (2018). Preparation and support for teachers in public schools: Reflections on the first year of teaching. Stats in Brief. NCES 2018–143. *National Center for Education Statistics*. Retrieved from https://nces.ed.gov/pubs2018/2018143.pdf

Boyd, R. D., & Apps, J. W. (1980). Redefining the discipline of adult education. *The AEA Handbook Series in Adult Education*.

Burkholder, G. J., Cox, K. A., & Crawford, L. M. (Eds.). (2016). *The scholar-practitioner's guide to research design*. Baltimore, MD: Laureate Publishing.

Butin, D. W. (2010). *The education dissertation: A guide for practitioner scholars*. Thousand Oaks, CA: Corwin.

Clandinin, D. J., Long, J., Schaefer, L., Downey, C. A., Steeves, P., Pinnegar, E., ... & Wnuk, S. (2015). Early career teacher attrition: Intentions of teachers beginning. *Teaching Education*, *26*(1), 1–16. doi:10.1080/10476210.2014.996746

Clark, R. C., & Mayer, R. E. (2011). *E-learning and the science of instruction: Proven guidelines for consumers and designers of multimedia learning*. John Wiley & Sons.

Coe, R. (2002). *It's the effect size, stupid: What effect size is and why it is important.* Retrieved from http://www.cem.org/attachments/ebe/ESguide.pdf

Cohen, J., & Goldhaber, D. (2016). Building a more complete understanding of teacher evaluation using classroom observations. *Educational Researcher*, *45*(6), 378–387. doi:10.3102/0013189X16659442

Cohen, L., Manion, L., & Morrison, K. (2018). *Research Methods in Education*: Vol. Eighth edition. Routledge.

Cramer, D., & Howitt, D. (2004). *The SAGE dictionary of statistics.* London, : SAGE Publications, Ltd doi: 10.4135/9780857020123

Dancer, D., Morrison, K., & Tarr, G. (2015). Measuring the effects of peer learning on students' academic achievement in first-year business statistics. *Studies in Higher Education*, *40*(10), 1808–1828. doi:10.1080/03075079.2014.916671

Desimone, L., Hochberg, E. D., & McMaken, J. (2016). Teacher knowledge and instructional quality of beginning teachers: Growth and linkages. *Teachers College Record*, *118*(5), n5. Retrieved from ERIC Number: EJ1089523

Dockter, J. (2016). The problem of teaching presence in transactional theories of distance education. *Computers and Composition*, *40*, 73–86. doi:10.1016/j.compcom.2016.03.009

Dubuclet, K. S., Lou, Y., & MacGregor, K. (2015). Design and cognitive level of student dialogue in secondary school online courses. *American Journal of Distance Education*, 29(4), 283–296. doi:10.1080/08923647.2015.1085722

Dugas, D. (2016). The ineffectiveness of "effective" management strategies: First-year teachers, behavior management, and identity. *Action in Teacher Education*, 38(1), 18–33. doi:10.1080/01626620.2015.1078754

Ekwunife-Orakwue, K. C., & Teng, T. L. (2014). The impact of transactional distance dialogic interactions on student learning outcomes in online and blended environments. *Computers & Education, 78*, 414–427. doi:10.1016/j.compedu.2014.06.011

Evens, M., Larmuseau, C., Dewaele, K., Van Craesbeek, L., Elen, J., & Depaepe, F. (2017). The effects of a systematically designed online learning environment on preservice teachers' professional knowledge. *Journal of Digital Learning in Teacher Education, 33(3),* 103–113. doi:10.1080/21532974.2017.1314779

Finn, K., & Campisi, J. (2015). Implementing and evaluating a peer-led team learning approach in undergraduate anatomy and physiology. *Journal of College Science Teaching*, *44*(6), 38–43. doi:10.2505/4/jcst15_044_06_38

Firat, M. (2016). Measuring the e-learning autonomy of distance education students. *Open Praxis*, *8(3),* 191–201. doi:10.5944/openpraxis.8.3.310

Forte, G. J., Schwandt, D. R., Swayze, S., Butler, J., & Ashcraft, M. (2016). Distance education in the US: A paradox. *Turkish Online Journal of Distance Education*. Retrieved from https://files.eric.ed.gov/fulltext/EJ1106346.pdf

Frankfort-Nachmias, C., & Leon-Guerrero, A. (2015). *Social statistics for a diverse society* (7th ed.). Thousand Oaks, CA: Sage Publications.

Frey, B. B. (Ed.). (2018). *The SAGE Encyclopedia of Educational Research, Measurement, and Evaluation*. SAGE Publications. 655–658. doi:10.4135/9781506326139

Gautam, S. S., & Tiwari, M. K. (2016). Components and benefits of E-learning system. *International Research Journal of Computer Science (IRJCS)*, *3*(1), 14–17. Retrieved from http://www.irjcs.com/volumes/Vol3/iss1/03.JAJCS10082.pdf

Gikandi, J. W., & Morrow, D. (2016). Designing and implementing peer formative feedback within online learning environments. *Technology, Pedagogy and Education*, *25*(2), 153–170. doi:10.1080/1475939X.2015.1058853

Goldring, R., Taie, S., & Riddles, M. (2014). Teacher attrition and mobility: Results from the 2012–13 teacher follow-up survey. First Look. NCES 2014–077. *National Center for Education Statistics*. Retrieved from https://nces.ed.gov/pubs2014/2014077.pdf

Gorsky, P., & Caspi, A. (2005). A critical analysis of transactional distance theory. *Quarterly Review of Distance Education, 6(1).* Retrieved from https://eric.ed.gov/?id=EJ874984

Greenberg, J., McKee, A., & Walsh, K. (2013). Teacher prep review: A review of the nation's teacher preparation programs. Retrieved from http://dx.doi.org/10.2139/ssrn.2353894

Grissom, J. A., Kalogrides, D., & Loeb, S. (2015). The micropolitics of educational

inequality: The case of teacher–student assignments. *Peabody Journal of Education*, *90*(5), 601–614. doi:10.1080/0161956X.2015.1087768

Guskey, T. (2009). Closing the knowledge gap on effective professional development. *Educational Horizons, 87*(4), 224–233. Retrieved from http://www.jstor.org/stable/42923773

Hannan, M., Russell, J. L., Takahashi, S., & Park, S. (2015). Using improvement science to better support beginning teachers: The case of the building a teaching effectiveness network. *Journal of Teacher Education*, *66*(5), 494–508. doi:10.1177/0022487115602126

Hanneman, R. A., Kposowa, A. J., & Riddle, M. D. (2012). *Basic statistics for social research*. Retrieved from https://ebookcentral.proquest.com

Hanover Report. (2017). Attraction, recruitment, and retention of educators. *Hanover Report*. Retrieved from https://www.wasa-oly.org/WASA/images/WASA/1.0%20Who%20We%20Are/1.4.1.6%20SIRS/Download_Files/2016-17/March%20-%20Attraction,%20Recruitment,%20and%20Retention%20of%20Educators.pdf

Hanson, J. M., Trolian, T. L., Paulsen, M. B., & Pascarella, E. T. (2016). Evaluating the influence of peer learning on psychological well-being. *Teaching in Higher Education*, *21*(2), 191–206. doi:10.1080/13562517.2015.1136274

Heale, R., & Twycross, A. (2015). Validity and reliability in quantitative research. *Evidence-Based Nursing*. 18. 66–67. doi:10.1136/eb-2015-102129

Heine, H. (2014). *G*Power: Statistical power analyses for Windows and Mac*. Retrieved from http://www.gpower.hhu.de/en.html

Helms-Lorentz, M., van de Grift, W., & Maulana, R. (2016). Longitudinal effects of induction on teaching skills and attrition rates of beginning teachers. *School Effectiveness and School Improvement*, 27(2), 178–204. doi:10.1080/09243453.2015.1035731

Hesamian, G. (n.d.). One-way ANOVA based on interval information. *International Journal of Systems Science*, *47*(11), 2682–2690. doi:10.1080/00207721.2015.1014449

Horzum, M. B. (2011). Developing transactional distance scale and examining transactional distance perception of blended learning students in terms of different variables. *Educational sciences: Theory and practice, 11(3)*, 1582–1587. Retrieved from https://eric.ed.gov/?id=EJ936610

Huang, X., Chandra, A., DePaolo, C., Cribbs, J., & Simmons, L. (2015). Measuring transactional distance in web-based learning environments: an initial instrument development. *Open Learning: The Journal of Open, Distance and e-Learning, 30(2),* 106–126. doi:10.1080/02680513.2015.1065720

Huang, X., Chandra, A., DePaolo, C. A., & Simmons, L. L. (2016). Understanding transactional distance in web-based learning environments: An empirical study. *British Journal of Educational Technology, 47(4),* 734–747. doi:10.1111/bjet.12263

Jacob, A., & McGovern, K. (2015). The Mirage: Confronting the hard truth about our quest for teacher development. *TNTP*. Retrieved from https://tntp.org

Jaggars, S. S., & Xu, D. (2016). How do online course design features influence student performance? *Computers & Education, 95*, 270–284. doi:10.1016/j.compedu.2016.01.014

Johnson, C. M. (2016). Rethinking online discourse: Improving learning through discussions in the online classroom. *Education and Information Technologies,* 21(6), 1483–1507. doi:10.1007/s10639-015-9395-3

Jolliffe, W., & Snaith, J. (2017). Developing cooperative learning in initial teacher education: indicators for implementation. *Journal of Education for Teaching*, 43(3), 307–315. doi:10.1080/02607476.2017.1319507

Kang, H., & Gyorke, A. (2008). Rethinking distance learning activities: A comparison of transactional distance theory and activity theory. *The Journal of Open, Distance and e-Learning, 23:3,* 203–214. doi:10.1080/02680510802420050

Karataş, S., Yılmaz, A. B., & Dikmen, C. H. (2017). Interaction in distance education environments. *Quarterly Review of Distance Education: Volume 18# 1*, *18(1)*, 63–82. Retrieved from https://eric.ed.gov/?id=EJ1152217

Kassandrinou, A., Angelaki, C., & Mavroidis, I. (2014). Transactional distance among open university students: How does it affect the learning process? *European Journal of Open, Distance and E-learning, 17(1),* 26–42. doi:10.2478/eurodl-2014-0002

Kennedy, M. M. (2016). How does professional development improve teaching? *Review of Educational Research*, *86(4)*, 945–980. doi:10.3102/0034654315626800

Kettler, R. J., & Reddy, L. A. (2017). Using observational assessment to inform professional development decisions: Alternative scoring for the Danielson framework for teaching. *Assessment for Effective Intervention, (1–12)*. doi:10.1177/1534508417745628

Kini, T., & Podolsky, A. (2016). Teaching experience and teacher effectiveness. *American Educator*, *40(3)*, 3. Retrieved from https://www.aft.org/our-news/periodicals/american-educator

Kleinsasser, R., & Hong, Y. C. (2016). Online group work design: Processes, complexities, and intricacies. *TechTrends, 60(6),* 569–576. doi:10.1007/s11528-016-0088-6

Knowles, M. S., Holton, E. F., & Swanson, R. A. (2014). *The adult learner: The definitive classic in adult education and human resource development*. New York, NY: Routledge.

Korhonen, H., Heikkinen, H. L., Kiviniemi, U., & Tynjälä, P. (2017). Student teachers' experiences of participating in mixed peer mentoring groups of in-service and pre-service teachers in Finland. *Teaching and Teacher Education, 61,* 153–163. doi:10.1016/j.tate.2016.10.011

Krutka, D. G., Carpenter, J. P., & Trust, T. (2016). Elements of engagement: A model of teacher interactions via professional learning networks. *Journal of Digital*

Learning in Teacher Education, *32*(4), 150–158. doi:10.1080/21532974.2016.1206492

Laerd Statistics (2017). *Statistical tutorials and software guides*. Retrieved from https://statistics.laerd.com/

Lambert, M. (2012). *A beginner's guide to doing your education research project*. Los Angeles, CA: Sage.

Larkin, K., & Jamieson-Proctor, R. (2015). Using transactional distance theory to redesign an online mathematics education course for pre-service primary teachers. *Mathematics Teacher Education and Development, 17(1),* 44–61. Retrieved from https://eric.ed.gov/?id=EJ1078418

Lawson, J. E., & Cruz, R. A. (2017). Evaluating special educators' classroom performance: Does rater "type" matter? *Assessment for Effective Intervention*, *43(4).* doi:10.1177/1534508417736260

Lynch, N. P., Cil, T., Lehane, E., Reardon, M., & Corrigan, M. (2014). Transatlantic peer-to-peer learning: An initial feasibility analysis. *Surgical Innovation*, *21*(6), 643–648. doi:10.1177/1553350614531660

Manuel, J., & Carter, D. (2016). Sustaining hope and possibility: Early-career English teachers' perspectives on their first years of teaching. *English in Australia*, *51*(1), 91. Retrieved from https://www.researchgate.net/profile/Jacqueline_Manuel2/publication/309173694_Sustaining_Hope_and_Possibility_Early-Career_English_Teachers%27_Perspectives_on_Their_First_Years_of_Teaching/

links/58041c8a08ae23fd1b68a2ac/Sustaining-Hope-and-Possibility-Early-Career-English-Teachers-Perspectives-on-Their-First-Years-of-Teaching.pdf

Martínez, J. F., Schweig, J., & Goldschmidt, P. (2016). Approaches for combining multiple measures of teacher performance: Reliability, validity, and implications for evaluation policy. *Educational Evaluation and Policy Analysis*, *38(4)*, 738–756. doi:10.3102/0162373716666166

McKenna, K. (2018). The online classroom: A thorough depiction of distance learning spaces. *The Journal of Continuing Higher Education, 66(1),* 13–21. doi:10.1080/07377363.2018.1415633

Miller, G. (2015). Associations between learner interaction and achievement in an online course: A longitudinal study 1. *NACTA Journal, 59(3),* 197. Retrieved from https://www.nactateachers.org/attachments/article/2319/9%20Miller_Sept2015%20NACTA%20Journal.pdf

Mkonto, N. (2017). Peer-facilitated learning: students' experiences. *Africa Education Review*, 1–16. doi:10.1080/18146627.2016.1224599

Moore, M. G. (1972). Learner autonomy: The second dimension of independent learning. *Convergence, 5(2),* 76–88. Retrieved from https://eric.ed.gov/?id=EJ064957

Moore, M. G. (1973). Toward a theory of independent learning and teaching. *The Journal of Higher Education, 44(9),* 661–679. doi:10.2307/1980599

Moore, M. G. (1980). Independent study. *Redefining the Discipline of Adult Education*, *5*, 16–31.

Moore, M. G. (1983). The individual adult learner. In M. Tight (Ed.), *Adult Learning and Education* (p. 153–168). London: Croom Helm.

Moore, M. G. (1993). Theory of transactional distance. *In D. Keegan (Ed.), Theoretical Principles of Distance Education* (pp. 22–29). New York: Routledge.

Moore, M. G. (2013). Transactional distance theory: Historical significance. *Handbook of Distance Education*, 66–85. doi:10.4324/9780203803738.ch5

Moore, M. G. (2016) Practicalities in giving structure to dialogue. *American Journal of Distance Education, 30:3*, 131–132. doi:10.1080/08923647.2016.1211450

Moore, M. G., & Diehl, W. C. (2019). *Handbook of distance education*. New York, NY: Routledge.

Moore, M. G., & Kearsley, G. (2011). *Distance education: A systems view of online learning.* Cengage Learning.

Moore, M. G., & Kearsley, G. (2012). *Distance education: A systems view of online learning.* Wadsworth, CA: Cengage Learning.

Muller, O., Shacham, M., & Herscovitz, O. (2017). Peer-led team learning in a college of engineering: First-year students' achievements and peer leaders' gains. *Innovations in Education and Teaching International*, 1–12. doi:10.1080/14703297.2017.1285714

Office for Human Research Protections, (2019). 45 C.F.R. §46.104(d)(4)(ii)

Paul, R. C., Swart, W., Zhang, A. M., & MacLeod, K. R. (2015). Revisiting Zhang's scale of transactional distance: refinement and validation using structural equation

modeling. *Distance Education, 36(3)*, 364–382. Retrieved from https://eric.ed.gov/?id=EJ1082834

Polikoff, M. S. (2015). The stability of observational and student survey measures of teaching effectiveness. *American Journal of Education*, *121*(2), 183–212. doi:10.1086/679390

Price, E., Coffey, B., & Nethery, A. (2015). An early career academic network: What worked and what didn't. *Journal of Further and Higher Education*, *39*(5), 680–698. doi:10.1080/0309877X.2014.971106

Quong, J., Snider, S. L., & Early, J. (2018). Reducing transactional distance in online and blended courses through the use of a closed social media platform. *Journal of Educational Technology Systems,* (734–747). doi:10.1177/0047239518766654

Ramirez, A., Clouse, W., & Davis, K. W. (2014). Teacher evaluation in Colorado: How policy frustrates practice. *Management in Education*, *28(2),* 44–51. doi:10.1177/0892020613511264

Robson, J. (2016). Engagement in structured social space: an investigation of teachers' online peer-to-peer interaction. *Learning, Media and Technology*, *41(1),* 119–139. doi:10.1080/17439884.2015.1102743

Rose, S., Spinks, N., & Canhoto, A. I. (2014). *Management research: Applying the principles*. Routledge.

Saba, F., & Shearer, R. L. (1994). Verifying key theoretical concepts in a dynamic model of distance education. *American Journal of Distance Education, 8(1)*, 36–59. doi:10.1080/08923649409526844

Sanders, W. L., Wright, S. P., & Horn, S. P. (1997). Teacher and classroom context effects on student achievement: Implications for teacher evaluation. *Journal of personnel evaluation in education, 11(1)*, 57–67. Retrieved from http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.581.9316&rep=rep1&type=pdf

Shearer, R. L., Gregg, A., & Joo, K. P. (2015). Deep learning in distance education: Are we achieving the goal? *American Journal of Distance Education, 29(2)*, 126–134. doi:10.1080/08923647.2015.1023637

Shepherd, D., & Devers, C. J. (2017). Principal Perceptions of New Teacher Effectiveness. *Journal of Education*, *(2)*, 37. doi:10.1080/08923647.2015.1023637

Simpson, A. (2016). Designing pedagogic strategies for dialogic learning in higher education. *Technology, Pedagogy and Education, 25(2)*, 135–151. doi:10.1080/1475939X.2015.1038580

State Department of Education. (n.d.). [redacted]

State Department of Education. (2015). [redacted]

State Department of Education. (2017). [redacted]

Stavredes, T., & Herder, T. (2014). *A guide to online course design: Strategies for student success*. San Francisco, CA: Jossey-Bass.

Steinberg, M. P., & Garrett, R. (2016). Classroom composition and measured teacher performance: What do teacher observation scores really measure? *Educational Evaluation and Policy Analysis*, *38(2),* 293–317. doi:10.1080/1475939X.2015.1038580

Steinberg, M. P., & Kraft, M. A. (2017). The sensitivity of teacher performance ratings to the design of teacher evaluation systems. *Educational Researcher*, *46*(7), 378–396. doi:10.3102/0013189X17726752

Stigmar, M. (2016). Peer-to-peer teaching in higher education: A critical literature review. *Mentoring & Tutoring: Partnership in Learning*, *24*(2), 124–136. doi:10.1080/13611267.2016.1178963

Suter, W. N. (2011). Introduction to educational research: A critical thinking approach. *SAGE publications*. 186–216. doi:10.4135/9781483384443

Swanson, E., McCulley, L. V., Osman, D. J., Scammacca Lewis, N., & Solis, M. (2017). The effect of team-based learning on content knowledge: A meta-analysis. *Active Learning in Higher Education*, (1–12). doi:10.1177/1469787417731201

Szczepek-Reed, B. (2017). Creating space for learner autonomy: an interactional perspective. *Classroom Discourse, 8(2)*, 175–190. doi:10.1080/19463014.2017.1328700

Taube, D. O., & Burkhardt, S. (1997). Ethical and legal risks associated with archival research. *Ethics & Behavior*, *7*(1), 59–67. doi:10.1207/s15327019eb0701_5

Thompson, J., Hagenah, S., Lohwasser, K., & Laxton, K. (2015). Problems without ceilings: How mentors and novices frame and work on problems-of-practice. *Journal of Teacher Education*, *66*(4), 363–381. doi:10.1177/0022487115592462

Trust, T. (2017). Using cultural historical activity theory to examine how teachers seek and share knowledge in a peer-to-peer professional development network. *Australasian Journal of Educational Technology*, *33(1).* doi:10.14742/ajet.2593

Turner, S. L., & Morelli, C. A. (2017). Five Essential Relationships Every New Teacher Needs to Build. *Kappa Delta Pi Record*, *53(3),* 134–137. doi:10.1080/00228958.2017.1334486

Unwin, A. (2015). Developing new teacher inquiry and criticality: The role of online discussions. *British Journal of Educational Technology, 46(6)*, 1214–1222. Retrieved from https://eric.ed.gov/?id=EJ1077687

Vagi, R., Pivovarova, M., & Miedel Barnard, W. (2017). Keeping Our Best? A Survival Analysis Examining a Measure of Preservice Teacher Quality and Teacher Attrition. *Journal of Teacher Education*, 1–13. doi:10.1177/0022487117725025

Validity-Statistics Solutions. (2017). *Statistics Solutions*. Retrieved 17 September 2017, from http://www.statisticssolutions.com/regression-analysis-validity/

Valizadeh, M. (2016). Iranian EFL Students' Emotional Intelligence and Autonomy in Distance Education. *English Language Teaching, 9(10),* 22–30. doi:10.5539/elt.v9n10p22

van der Meer, J., Wass, R., Scott, S., & Kokaua, J. (2017). Entry characteristics and participation in a peer-learning program as predictors of first-year students' achievement, retention, and degree completion. *AERA Open*, *3(3),* 1–13. doi:10.1177/2332858417731572

Vasiloudis, G., Koutsouba, M., Giossos, Y., & Mavroidis, I. (2015). Transactional distance and autonomy in a distance learning environment. *European Journal of Open, Distance and E-learning, 18(1),* 114–122. doi:10.1515/eurodl-2015-0008

Vaske, J. J., Beaman, J., & Sponarski, C. C. (2017). Rethinking Internal Consistency in Cronbach's Alpha. *Leisure Sciences*, *39(2)*, 163–173. doi:10.1080/01490400.2015.1127189

Walser, T. M. (2014). Quasi-experiments in schools: The case for historical cohort control groups. *Practical Assessment, Research & Evaluati*on, *19(6)*, 2.

Williams, B., & Reddy, P. (2016). Does peer-assisted learning improve academic performance? A scoping review. *Nurse Education Today*, *42*, 23–29. doi:10.1016/j.nedt.2016.03.024

Williams, J. M., & Perrin, P. (2015). Colorado state model education evaluator system for teachers: Baseline study of the validity of professional practice ratings. Retrieved from http://www.cde.state.co.us/educatoreffectiveness/2015_teacher_validity_study

Williams, N. V., & Gillham, J. C. (2016). New teacher perceptions of induction programs: A study of open-ended commentary. *Mid-Western Educational Researcher*, *28(3),* 218–231. Retrieved from https://eric.ed.gov/?id=EJ1117844

Wong, H. K. (2004). Induction programs that keep new teachers teaching and improving. *NASSP Bulletin*, *88(638),* 41–58. doi:10.1177/019263650408863804

Xiao, J. (2017). Learner-content interaction in distance education: The weakest link in interaction research. *Distance Education, 38(1),* 123–135. doi:10.1080/01587919.2017.1298982

Xu, X., Grant, L. W., & Ward, T. J. (2016). Validation of a statewide teacher evaluation system: Relationship between scores from evaluation and student academic progress. *NASSP Bulletin*, *100(4),* 203–222. doi:10.1177/0192636516683247

Yang, S. H. (2016). Conceptualizing effective feedback practice through an online community of inquiry. *Computers & Education*, *94*, 162–177. doi:10.1016/j.compedu.2015.10.023

Yariv, E., & Kass, E. (2017). Assisting struggling teachers effectively. *Educational Management Administration & Leadership*, (1–16). doi:10.1177/1741143217725323

Yılmaz, R., & Keser, H. (2017). The impact of interactive environment and metacognitive support on academic achievement and transactional distance in online learning. *Journal of Educational Computing Research, 55(1),* 95–122. doi:10.1177/0735633116656453

Appendix A: Local Request to Conduct Research

Pursuant to district policy GCS, **School District Name** seeks to support research that could inform operations and help deliver better service to stakeholders. In recognition of the importance of evidence-based practices, while acknowledging its responsibility to protect sensitive data and research participants, the District requires this form to be completed in its entirety. To increase the likelihood of approval, please provide detailed information.

Project Title: The Influence of Peer-to-Peer E-Learning on Professional Practices of First- Year Teachers

Researcher Information:

Name: Brian K. Green Organization: **School District Name** & Walden University Phone: [redacted]

Description of Proposed Research/Study. *Include a) locations, b) population of interest, c) timeframes, d) hypotheses, e) analyses, f) intended audience, and g) plans for dissemination.*

a) **Location:** This research was comparing the influence of a peer-to-peer e-learning design, also known as Peer-Driven Professional Development (PD^2), on first-year teachers in the **School District Name** induction program.

b) **Population of Interest:** All 2016–2017 and 2017–2018 first-year teachers in **School District Name** coordinated schools.

c) **Time Frame:** First-year teachers, as a requirement of the district-wide induction program, are participating in four PD^2 modules throughout 2017–2018

school year (August 15, 2017 through April 30, 2018). Teacher Quality Standards scores from first year teachers in 2017–2018 (experimental) will be compared to Teacher Quality Standards scores of first-year teachers in 2016–2017 (control) who did not participate in PD^2.

The goal was to have this study completed and ready for publication by December 2018.

d) **Research Questions and Hypotheses:**

RQ1: What is the difference in three Teacher Quality Standard (2-4) scores as measured by the State Model Evaluation of first-year teachers who participated in induction training with peer-to-peer e-learning (PD^2) and those who completed induction prior to the implementation of the peer-to-peer training program?

H_o1: There is no relationship between the Teacher Quality Standard scores of teachers who had peer-to-peer e-learning (experimental) and first-year teachers who did not have peer-to-peer e-learning (control).

H_11: There is a relationship between the Teacher Quality Standard scores of teachers who had peer-to-peer e-learning (experimental) and first-year teachers who did not have peer-to-peer e-learning (control).

RQ2: What is the difference in three Teacher Quality Standard (2–4) scores as measured by the State Model Evaluation of first-year secondary and first- year elementary teachers who participated in induction training with peer-to-peer e-learning (PD^2) and those who completed induction prior to the implementation of the peer-to-peer training program?

e) **Analyses:** Descriptive statistics, t-test, and ANOVA will be used in this study to answer the research questions - the influence of peer-to-peer e-learning on professional practices of first-year teachers. Descriptive statistics will be used to describe and summarize the data. The t-test will be used to explain whether there are statistically significant differences between Teacher Quality Standard scores of the control group (2016–2017 first-year teachers without PD2) and experimental group (2017–2018 first-year teachers with PD2). The ANOVA will be used to

H_o2: There is no relationship between the Teacher Quality Standard scores of elementary and secondary teachers who had peer-to-peer e-learning (experimental) and first-year teachers who did not have peer-to-peer e-learning (control).

H_12: There is a relationship between the Teacher Quality Standard scores of elementary and secondary teachers who had peer-to-peer e-learning (experimental) and first-year teachers who did not have peer-to-peer e-learning (control).

analyze statistical differences between Teacher Quality Standard scores for elementary and secondary first-year teachers.

f) **Intended Audience:** The intended audiences for this study are educational leaders of professional learning and induction programs.

g) **Plans for Dissemination:** Walden University approved dissertations will be submitted to Scholar Works for publication and available in the Walden University Library.

h) **Funding Sources:** No funding sources will be used to support this study. The researcher will pay all expenses related to extracting and preparing data.

IRB. Has/will this project be submitted to an IRB for review? If the project will be submitted, what is the anticipated date of review/approval?

This project has not been submitted for Walden University IRB review, yet. However, Walden University IRB approval is required prior to examining data related to this study. The estimated Walden University IRB approval is July 2018.

Data Elements. *Are you requesting any data from the district? If using collected data which data elements/variables will you be analyzing? Are you planning to generate data with a survey or instrument not routinely used?*

Surveys: No survey instruments will be used.

Archival Data: Archival data from first-year teacher evaluations are being requested from **School District Name**. The data being requested include the composite educator effectiveness scores for Teacher Quality Standards 2 through 4. Teacher quality standard 6, which include student learning outcome scores, is not requested for this study.

Data Security Plan. *How will you protect the privacy of participants, maintain data confidentiality, dispose of data, etc.?*

Instruments/Documents. *Please attach copies of any supporting documents to include IRB approval, informed consents, surveys/data collection instruments, etc.*

This commencement of this study is incumbent on IRB approval of Walden University and **School District**. The Walden University IRB board follows a strict and

Archival data will be used in this study and all participants will be made unidentifiable. All data will be kept in my possession and secured in a safety deposit box for 5 years after the study concludes; then the data will be destroyed. The digital data will be stored on a secured digital disk and the disk will be destroyed after 5 years?

accredited process to protect everyone involved in the study. For this study, only archival data will be requested and used. No informed consent will be used, as using archival data does not require informed consent by participants. The data requested for this study include composite educator effectiveness scores for Teacher Quality Standards II, III, and IV of first-year teachers (2016–2018). Teacher quality standard VI, which focuses on student learning outcomes, is specifically not requested for this study.

Impact on the District. *Please explain how the project will impact the normal operation of the district (e.g. changes to processes to allow for data collection, requirement of additional staff time).*

PD^2, a new peer-to-peer e-learning design, is an online professional learning element required by all first-year teachers in the **School District** induction program. There will be no disruption to the inductee's otherwise normal day-to-day operation. This study will disrupt normal operations for the employees who will collect, prepare, and disseminate the Teacher Quality Standard scores. It is unclear at this point how much extra time will be needed to collect these data. However, it is understood that the researcher will pay the extra expense required to collect, prepare, and disseminate requested data.

Benefit to the District.

School District stands to learn the influence of peer-to-peer e-learning (PD2) on professional practices of first-year teachers relative to Teacher Quality Standards 2- 4. Findings from this study will inform **School District** on the future use of peer-to-peer e-learning (PD2) to grow professional practices of first-year teachers in the district induction program.

Appendix B: State Model Evaluation System Permission

- S.B. 10-191 requires the State Department of Education to make tools and materials available to schools and districts to support their educator evaluation efforts.
- These materials are intended to provide meaningful support and resources to realize State's vision for Educator Effectiveness which is: Effective educators for every student, effective leaders for every school.
- Users may access resources at CDE's Educator Effectiveness homepage:
- http://www.[redacted]
- All of the documents referred to in this user's guide as well as many other tools and materials to help schools and districts operationalize S. B. 10-191 may be found on the Educator Effectiveness homepage (State Department of Education, n.d., p. 345)

Appendix C: Teacher Quality Standards and Elements

Teacher Quality Standards (State Department of Education, n.d.)

TEACHER QUALITY STANDARD I: Teachers demonstrate mastery of pedagogical expertise in the content they teach.

- ELEMENT A: Teachers provide instruction that is aligned with the State Academic Standards; their district's organized plan of instruction; and the individual needs of their students.
- ELEMENT B: Teachers demonstrate knowledge of student literacy development in reading, writing, speaking and listening.
- ELEMENT C: Teachers demonstrate knowledge of mathematics and understand how to promote student development in numbers and operations, algebra, geometry and measurement and data analysis and probability.
- ELEMENT D: Teachers demonstrate knowledge of the content, central concepts, tools of inquiry, appropriate evidence-based instructional practices and specialized character of the disciplines being taught.
- ELEMENT E: Teachers develop lessons that reflect the interconnectedness of content areas/disciplines.
- ELEMENT F: Teachers make instruction and content relevant to students and take actions to connect students' background and contextual knowledge with new information being taught.

TEACHER QUALITY STANDARD II: Teachers establish a safe, inclusive and respectful learning environment for a diverse population of students.

- ELEMENT A: Teachers foster a predictable learning environment in the classroom in which each student has a positive, nurturing relationship with caring adults and peers.
- ELEMENT B: Teachers demonstrate a commitment to and respect for diversity, while working toward common goals as a community and as a country.
- ELEMENT C: Teachers engage students as individuals with unique interests and strengths.
- ELEMENT D: Teachers adapt their teaching for the benefit of all students, including those with special needs across a range of ability levels.
- ELEMENT E: Teachers provide proactive, clear and constructive feedback to families about student progress and work collaboratively with the families and significant adults in the lives of their students.
- ELEMENT F: Teachers create a learning environment characterized by acceptable student behavior, efficient use of time and appropriate intervention strategies.

TEACHER QUALITY STANDARD III: Teachers plan and deliver effective instruction and create an environment that facilitates learning for their students.

- ELEMENT A: Teachers demonstrate knowledge of current developmental science, the ways in which learning takes place and the appropriate levels of intellectual, social and emotional development of their students.

- ELEMENT B: Teachers plan and consistently deliver instruction that draws on results of student assessments, is aligned to academic standards and advances students' level of content knowledge and skills.
- ELEMENT C: Teachers demonstrate a rich knowledge of current research on effective instructional practices to meet the developmental and academic needs of their students.
- ELEMENT D: Teachers thoughtfully integrate and utilize appropriate available technology in their instruction to maximize student learning.
- ELEMENT E: Teachers establish and communicate high expectations for all students and plan instruction that helps students develop critical-thinking and problem-solving skills.
- ELEMENT F: Teachers provide students with opportunities to work in teams and develop leadership qualities.
- ELEMENT G: Teachers communicate effectively, making learning objectives clear and providing appropriate models of language.
- ELEMENT H: Teachers use appropriate methods to assess what each student has learned, including formal and informal assessments, and use results to plan further instruction.

TEACHER QUALITY STANDARD IV: Teachers reflect on their practice.

- ELEMENT A: Teachers demonstrate that they analyze student learning, development and growth and apply what they learn to improve their practice.
- ELEMENT B: Teachers link professional growth to their professional goals.

- ELEMENT C: Teachers are able to respond to a complex, dynamic environment.

TEACHER QUALITY STANDARD V: Teachers demonstrate leadership.

- ELEMENT A: Teachers demonstrate leadership in their schools.
- ELEMENT B: Teachers contribute knowledge and skills to educational practices and the teaching profession.
- ELEMENT C: Teachers advocate for schools and students, partnering with students, families and communities as appropriate.
- ELEMENT D: Teachers demonstrate high ethical standards.

TEACHER QUALITY STANDARD VI: Teachers take responsibility for student academic growth.

- ELEMENT A: Teachers demonstrate high levels of student learning, growth and academic achievement.
- ELEMENT B: Teachers demonstrate high levels of student academic growth in the skills necessary for postsecondary and workforce readiness, including democratic and civic participation. Teachers demonstrate their ability to utilize multiple data sources and evidence to evaluate their practice, and adjust where needed to continually improve attainment of student academic growth.