8-2017

Teachers' Perceptions of Professional Development on the Effective Integration of Technology to the Classroom

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Dissertation submitted to the Faculty of the College of Education

in partial fulfillment of the requirements for the degree of

Doctor of Education in

Teacher Leadership

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2017

Abstract

The purpose of this research study was to determine differences between teachers' perceptions of the effectiveness of professional development–t related to the integration of technology into the curriculum with respect to teachers' years in education, highest degree level earned, and self-assessed technology usage level. Technology integration is a problem among teachers in northwestern New Jersey because educators are held accountable to state technology standards through student test scores and students are not performing well on the Partnership for Assessment of Readiness for College and Career tests. A review of literature examined professional development activities related to the integration of technology into the curriculum.

The results revealed that teachers with novice level experience have greater perceptions of the effectiveness of professional development related to the integration of technology into the curriculum than experienced teachers. The perceptions of the effectiveness of professional development related to the integration of technology into the curriculum does not differ with respect to the highest degree earned by the teacher. There is a moderate positive relationship between teachers' self-assessment of their use of technology in class and their perception of related professional development effectiveness.

Keywords: professional development, technology, curriculum, technology integration, effectiveness of professional development

Dedication

This project is dedicated to my beloved family, my reason for being. To my high school sweetheart, my husband Lou, who has been with me since we were teenagers; sometimes in front of me, sometimes behind me, sometimes walking hand in hand, but always nearby. When you told me we were in this together, you meant it, and, although I am not sure you knew how much time and energy it would take, you never gave up on our dream. "If it was easy, everyone would do it!"

My children, Alexandra, Bayleigh, and Hunter, who are the center of my universe. Almost every dissertation I read had an apology from the parent author to their children for all the missed family time, missed celebrations and activities, and missed sporting events, and I was determined not to include that in mine. Of course, I did miss some events, but the love, support, and enthusiasm you three showed me was unbelievable. Without guilt or complaint, you showed faith in me made this project possible. The extra effort you had to make to help keep the family and the farm running did not go unnoticed, and your continued successes at academics, athletics, and personhood while adulting for me are awesome. You are people of good character, integrity, morals, and values, and if you were not already my children, I would want you to be! You are incredible kids, of whom I am most proud. Everything I do, I do for you; and know that you all make me happy every single day. Love forever and always.

My parents were the original support system of my life and continue to be. Throughout this academic journey, you offered time, energy, assistance, and love constantly, but especially when I needed it most. Meme and Cappy are my biggest cheerleaders. Role models of integrity, values, kindness, compassion, strength, and character for parenting and for life. You are my village and I would not be where I am without you.

The years throughout this educational journey were full of ups and downs, including both my mother and my mother-in-law being diagnosed with cancer. My mother went through over a year of surgeries, treatments, and recovery and stayed strong in her faith. It was her strength that my mother-in-law cited as her inspiration when she was diagnosed with cancer a year later. As she went through treatments for her inoperable cancer, she remained steadfast in her faith and comforted by the love of her close family. As I was helping out, Omi would often tell me to go work on my project, but I always asked myself the same question: "When I look back on this moment, will I say, 'Gosh, I am happy I got that chapter done,' or will I say, 'I am so happy I spent that time with Omi'?" I am so happy and I regret nothing. Omi, we love you and miss you every day. We learned together, as a family, that life does not have to be perfect to be wonderful. So, family, here is to a wonderful life!

I noticed that all the dissertations I read also had dedications to God, which led me to wonder if only religious people write dissertations or if the process of earning a doctoral degree leads people to God. I guess that is the stuff of another research study. I give God the glory for this completed journey, because I truly would not be here without Him. I put my faith, my worry, my hope in God. For nothing is impossible with God—Luke 1:37.

To the rest of my village, my family, friends, and colleagues, who helped me in one way or another throughout this journey: I appreciate you and everything you did for me and my family along the way. Especially Dr. Susan Cunico, Marc, Morgan, Danny, and Lauren, for keeping us healthy, happy, and loved. Bridget and family for the love & support throughout the years. Mary Pat, Kelli, and family for all the love & support and the many times you took the girls to lacrosse, volleyball, US National U18 Fistball practices and tournaments (Go Team USA!), and lots of other activities, thank you, thank you. Deirdre and my Upper North Hall pals,

thank you for keeping me on track at work when my mind was everywhere else. Thank you to my cohort colleagues, who were among the most dedicated, professional, supportive people I have ever been blessed to know.

To each person who directly or indirectly supported me throughout this research project, thank you. This project is dedicated to all these most important people in my life who have been a constant support and encouragement in my pursuit of knowledge. To use my son's catchphrase, #Iamblessed.

Acknowledgments

It is with sincere gratitude and appreciation that I acknowledge the following individuals who have assisted me in this academic endeavor.

I wish to first thank my family, without whom this entire project would not exist. My beloved husband, Lou, my three beautiful, inspiring children, Alexandra, Bayleigh, and Hunter, and my loving parents, Meme and Cappy.

I wish to thank my committee members, who were so generous with their expertise and precious time. A special thanks to Dr. Brandy Kamm, my committee chairman, for taking me on almost halfway through this process, which must have been a truly daunting task. Her countless hours of reflecting, reading, encouraging, and most of all patience throughout the entire process is so appreciated. Thank you to Dr. Judy Shoemaker; your meticulous eye for detail and exceptional content knowledge are greatly appreciated, as are the time and assistance you provided. Dr. Kamm and Dr. Shoemaker, thank you for agreeing to serve on my committee and for your continued dedication throughout. Dr. Angela Owusu-Ansah, thank you for sharing your expertise in quantitative analysis with me; your enthusiasm and positivity helped me more than you will ever know. Dr. Marty Bullis and Dr. Jerry McGuire, thank you for the support and assistance you provided at times when I needed it the most; I truly appreciate it. Additionally, I was blessed to go through this process with some wonderful classmates, and without their friendship, encouragement, and support, it would not have been as rewarding as it was.

Finally, I would like to thank the teachers who assisted me with this project. Their assistance and willingness to provide feedback made the completion of this research project possible.

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Chapter 1: Introduction

Schools use technology as a tool to help students access, interpret, organize, synthesize, and present information (Kee, Kupczynski, & Mundy, 2012). Far greater use of technology is expected of students, teachers, and school districts than ever before to help meet the needs of a diverse population preparing them to compete in a global society (Achieve, 2013; Dede, 2014; National High School Center, 2011; United States Department of Education, 2010). Schools must prepare students to become technologically literate, responsible, and respectful digital citizens in a global community (Achieve, 2013, 2013; ACT, 2008; Gorlewski, 2013). An understanding of the use of technology offers opportunities to function effectively and helps students to confront a wide range of real-world issues in an increasingly technological world (Achieve, 2013; ACT, 2008; Dede, 2014; Gorlewski, 2013; Kee et al., 2012). These issues include: students must communicate effectively with a variety of people, appreciate other cultures and ways of living, and think clearly and deeply, so that they are able to solve complex problems in a variety of subject areas.

Researchers indicate that a lack of quality, effective professional development for teachers is a barrier to the successful integration of technology into the classroom (Broussard, 2009; Dede, 2014; Erişti, Kurt, & Dindar, 2012; Fullerton, 2013; Kee et al., 2012; Keppler, Weiler, & Maas, 2014; Thompson, 2015). Early test results from the Partnership for Assessment of College and Career Readiness (PARCC) indicate a potential for mode effects based on the setting of the test administration (Herold, 2016). Mode effects are differences in results that may be caused by the setting, format, or location in which the test is conducted (Herold, 2016). A disparity in the test scores of students demonstrating proficiency taking the PARCC test online versus those taking it on paper existed across all grade levels tested (Herold, 2016). A mode

effect seems to exist between students using computers to complete the test online and students taking the test in a traditional format using pencil and paper (Herold, 2016). Teachers must assist students in achieving proficient use of technology in the elementary and middle grades if learners are to become active, responsible citizens who hold meaningful, productive jobs and contribute to the community.

Background, Context, History, and Conceptual Framework of the Problem

Standards based accountability for both teachers and students are a national concern as a result of the development of content and performance based standards for students, standardized assessments of those standards, and the outcomes of these assessments affecting teacher evaluations (Achieve 2013; Dede, 2014). New Common Core State Standards for education, student achievement expectations, and standardized testing are focuses of education accountability reform (Achieve, 2013; Dede, 2014). Students must be prepared to use many forms of technology accurately and resourcefully throughout their primary education, college, and career (Achieve, 2013; Gorlewski, 2013; National High School Center, 2011).

The Common Core State Standards are a set of expectations regarding the knowledge and skills necessary for students to be college and career ready so they can become technologically literate digital citizens ready to compete in a global world (Achieve, 2013; ACT, 2008; Gorlewski, 2013). Students must be prepared to live and work in an increasingly technological world and must have the ability to use technology to function effectively (Achieve, 2013; ACT, 2008; Dede, 2014; Gorlewski, 2013; Kee et al., 2012). Educators effectively teaching technology and digital literacy is vital to the maintenance and growth of our nation's economic and technical competitiveness and to maintaining our status in the global marketplace

(Gorlewski, 2013). There is a need for teachers to be well versed on helping students meet these requirements as set out by the government and the global society (Gorlewski, 2013)

The State of New Jersey and local school districts located in New Jersey have specific requirements for certified educators, which include teacher evaluations, professional development, data recording, and lesson plan formats. Professional development that is effective and ongoing increases teaching skills and improves student achievement (Darling-Hammond, 2010; United States Department of Education, 2017). Effective professional development helps to connect technology to the curriculum with a basis in educational standards (Penuel, 2006). The State of New Jersey Department of Education stipulates that teachers have a minimum of twenty hours of professional learning experiences per school year (State of New Jersey, 2013). These professional learning experiences should follow the professional standards for teachers and contribute to developing teacher practice, strategies, knowledge, and skills that improve student learning and achievement (State of New Jersey, 2013). New legislation introduced in New Jersey requires that teachers receive effective professional development to enable them to integrate technology into the classroom, ensuring students are provided with the skills and ability to compete at the global level (New Jersey Assembly, 2015, para. 1).

The format of professional development used varies by school district, administrators, and staff (Boston Consulting Group, 2014). Professional development based in practice, with learning from experiences and experimentation is often rewarding (Fullan, 2011). There are multiple formats of professional development that are offered in school districts, including job-embedded professional development, digital literacy coaching, online coursework, workshops, and in-service training sessions (Boston Consulting Group, 2014; Cooper, 2014; Robertson, 2011; State of New Jersey, 2013; Turner & White, 2015). New Jersey has been ranked as the top

overall school system in the country and is second for education output and safety (Napoliello, 2014).

The students' level of proficiency with computer skills and digital literacy is assessed directly in New Jersey as students take the Partnership for Assessment of Readiness for College and Career (PARCC) standardized exam online (Clark, 2016; Herold, 2016). At present, the State of New Jersey uses the New Jersey Student Learning Standards and the standardized assessments created by the PARCC (Achieve, 2013). Three separate assessments are scheduled for many fourth-grade students in New Jersey, including the new online PARCC exam (Achieve, 2013), the New Jersey Ask Science exam (State of New Jersey, 2014b), and the National Assessment of Educational Progress (NAEP), with the NAEP and the PARCC being offered entirely online (Clark, 2016; Herold, 2016). Without proficiency in basic computer skills and digital literacy, New Jersey's students will not be able to adequately display their language arts and mathematics knowledge on the computerized PARCC and NAEP tests (Clark, 2016; Herold, 2016).

The New Jersey Student Learning Standards for technology address educational technology, such as digital literacy and information and communication technology, and technology education, including engineering, design, and computation (State of New Jersey, 2014d). These standards provide a guide for what students are expected to learn about technology and the implementation of these standards in 2014 required school districts to provide learning opportunities for all students in technology (State of New Jersey, 2014d). The New Jersey Student Learning Standards set the expectation that students will become technologically literate, responsible, and respectful digital citizens in a global community (State of New Jersey, 2014d). Although these standards were implemented in 2014 (State of New

Jersey, 2014d), when the PARCC standardized test was administered in 2015, less than 53% of New Jersey students in grades three through eight scored at the proficient level using a computer to complete the exam (State of New Jersey, 2016a; State of New Jersey, 2016c).

A bill was introduced into the New Jersey legislature on June 11, 2015, to establish a "task force to study issues and make recommendations related to use of educational technology in public school classrooms" (New Jersey Assembly, 2015, para. 1). Legislators enacted this bill to investigate issues, including the implementation of technology standards, and make recommendations regarding the use of technology in education in the State of New Jersey (para. 1). The bill, enacted by the Senate and General Assembly of the State of New Jersey, declared that "teachers need ongoing professional development to ensure that they are able to confidently and effectively integrate technology as an instructional tool in their classrooms" (para. 2). The Senate and General Assembly of the State of New Jersey recognize the importance of effective, appropriate professional development for integrating technology into the curriculum. This study was designed to examine teacher perception of the effectiveness of professional development for the integration of technology into the classroom and curriculum to possibly provide data that may serve as ground work for the proposed task force providing useful information on the current state of technology training and teacher perceptions of the effectiveness of the training.

Theoretical Framework

Social constructivism is the theoretical lens that was used to focus this study, and the research methodology for the study was a quantitative survey of preschool through eighth-grade teachers in elementary schools located in northwestern New Jersey. Current education theories are based on knowledge scaffolding, like the social constructivism theory which focuses on

critical thinking, meaningful reflection, and social interaction (Almala, 2005). This study was based on the technology proficiency requirements set by the United States Department of Education. The Blueprint for Learning (United States Department of Education, 2010a) calls for professional development to improve student learning using resources and materials that are aligned with the college and career readiness standards.

The National Education Technology Plan (United States Department of Education, 2017; United States Department of Education, 2010b) calls for improved, effective, ongoing professional development for teachers to completely integrate this national technology plan and transform education. However, the success or failure of the infusion of technology into the classroom cannot be precisely determined (Gao, Choy, & Wong, 2009; Kay, 2006; Wozney, Venkatesh, & Abrami, 2006). If teachers are to become proficient in technology and improve their ability to infuse technology in the curriculum, they will need to be offered extended, effective professional development in digital technology (Broussard, 2009; Kee et al., 2012; United States Department of Education, 2017; United States Department of Education, 2010b). Many teachers feel unprepared to use technology effectively for classroom instruction (Boston Consulting Group, 2014; Broussard, 2009; Latio, 2009).

There is a disparity between the format of professional development on which districts focus and that which teachers believe is helpful (Boston Consulting Group, 2014). Only a small percentage of teachers believe that the professional development they receive is satisfactorily preparing them to use technology in the classroom and to instruct students in the Common Core State Standards (Boston Consulting Group, 2014). Few educators believe that professional development is improving citing barriers such as time allotted, lack of technology tools, and limited resources available (Boston Consulting Group, 2014).

Research conducted by the Bill and Melinda Gates Foundation identified that "the way in which schools and districts deliver professional learning is highly fragmented and [is] characterized by key disconnects between what decision-makers intend and the professional learning teachers actually experience" (Boston Consulting Group, 2014, p. 3). Little research has been conducted on teacher perception of effective professional development for technology integration into the classroom (Martin, Strother, Beglau, Bates, Reitzes, & Culp, 2010, Penuel, 2006, Wolf, Lindeman, Wolf, and Dunnerstick, 2011). Professional development in technology-related programs for teachers is necessary to improve the integration of technology into everyday classroom teaching, but the format of that professional development needs to be appropriate and effective for teachers.

Teachers' perceptions of the effectiveness of professional development addressing technology use in the classroom must be determined, because teachers are required to use technology and schools are required to provide professional development opportunities for educators. The evaluation of the current level of teacher technology usage through this study serves as the basis for the newly enacted technology task force. This study also investigated whether teachers' perceptions of the effectiveness of professional development changes depending upon their years of experience, highest degree level earned, or self-proclaimed level of experience with technology.

Statement of the Problem

Technology integration is a problem among teachers in northwestern New Jersey because without proficiency in digital literacy and technology skills, New Jersey's students will not be able to exhibit their language arts and mathematics knowledge on the computerized PARCC standardized tests (Clark, 2016; Herold, 2016).

The problem is that with the introduction of New Jersey Student Learning Standards for Technology which expect that students will be digitally literate using technology effectively in a globally competitive worldwide market (New Jersey Department of Education, 2015; State of New Jersey, 2014d). Almost half of New Jersey students taking the PARCC standardized assessment given online in New Jersey did not score in the proficient range (State of New Jersey, 2016a; State of New Jersey, 2016c). A task force created by the New Jersey Legislature was charged with studying the issues related to the implementation of the technology standards and integrating technology into the curriculum, focusing on professional development for teachers (New Jersey Assembly, 2015, para. 1). This study examined the perceptions of teachers in northwestern New Jersey to determine if the mandated professional development is effective.

The New Jersey Student Learning Standards for technology address educational technology and technology education providing guidelines for what students are expected to learn about technology (State of New Jersey, 2014d). The implementation of these standards in 2014 required school districts to provide learning opportunities for all students in technology with the expectation that students will become technologically literate digital citizens prepared for college or career in a global society (State of New Jersey, 2014d). These standards were implemented in 2014 (State of New Jersey, 2014d), but when the PARCC standardized test was administered in 2015, less than 53% of New Jersey students in grades three through eight scored at the proficient level using a computer to complete the exam (State of New Jersey, 2016a; State of New Jersey, 2016c).

Educators are held accountable to state technology standards through student test scores and students are not performing well on these online standardized assessments. This is a problem because student achievement makes up 30% of overall teacher evaluation scores, and

less than 53% of New Jersey students in grades three through eight scored at the proficient level on the PARCC test in 2015–2016 (State of New Jersey, 2016a; State of New Jersey, 2016c). Technology training is insufficient for teachers to effectively integrate technology into the classroom (Boston Consulting Group, 2014; Brown, 2014; NCES, 2010; Unger & Tracey, 2013).

A bill was introduced into the New Jersey legislature on June 11, 2015, to establish a commission to study the developments in educational technology in public schools (New Jersey Assembly, 2015, para. 1). Legislators in the Senate and General Assembly of the State of New Jersey enacted this bill to investigate issues, including the implementation of technology standards, and make recommendations regarding the use of technology in education in the State of New Jersey (para. 1). The bill, enacted by the Senate and General Assembly of the State of New Jersey, declared that professional development for teachers should enable them to efficaciously integrate technology into the curriculum for use in the classroom according to the state standards (para. 2). The results of this study provide a baseline indicator of teachers' perceptions of the effectiveness of professional development in the area of technology integration in the classroom from which the task force can work. This study is designed to examine if the current professional development in the state of New Jersey is seen by teachers as effective.

Teachers often find it difficult to improve their use of technology for instruction since they have minimal effective professional development for using technology in the classroom (Boston Consulting Group, 2014; Broussard, 2009; Dede, 2014; Erişti et al., 2012; Fullerton, 2013; Kee et al., 2012; Keppler et al., 2014; NCES, 2010; Thompson, 2015; Unger & Tracey, 2013). School districts select and finance professional development with the intention of providing opportunities for growth and development of the staff; however, common professional

development opportunities include one-day workshops, after-school meetings, or online video learning experiences, which the majority of teachers do not prefer (Boston Consulting Group, 2014).

A disparity exists between the format of professional development that districts focus on and the type that teachers believe is helpful (Boston Consulting Group, 2014). Research indicates that a lack of quality, effective professional development for teachers is a barrier to the successful integration of technology into the classroom (Boston Consulting Group, 2014; Erişti et al., 2012; Thompson, 2015). Teachers need a high level of technology proficiency to be capable of taking on the changing role of preparing students for living and working in the 21st century (Okojie & Olinzock, 2013; Roth, 2014). Some teachers do not feel confident in their own use of some of these digital literacy skills in information and communication technologies or in their ability to teach them (Okojie & Olinzock, 2013; Roth, 2014).

Of the students in New Jersey taking the PARCC exam, 99.5% of the students completed the assessment online (Herold, 2016). Herold (2016) reports that PARCC tests scores were significantly lower when students completed the 2015 PARCC test online as compared to when they took them on paper. Of students taking the PARCC test in Illinois, seven percent more students scored at the proficient level on paper tests than did those who took the online version (Herold, 2016). Administrators at the Baltimore County schools in Maryland found that among students with equivalent demographics and educational backgrounds, those who completed the PARCC test on paper scored an average of 14 points higher than those students who tested online (Herold, 2016).

The discrepancy between online and on-paper testing of language arts proficiency is an ongoing national problem as evidenced by the NAEP assessment results, which reveal that only

27% of United States students in eighth grade scored at the proficient level or higher on the NAEP in 2011 (Fleming, 2012). Statewide concerns have arisen over the changes to standardized tests, the grading methods, and the interpretation of the results, but the scores stand as final scores. According to the 2015 online PARCC scores, 57% of third-grade students and 50% of fourth-grade students in this northeastern state are not meeting Common Core State Standards for these grade levels in language arts (New Jersey Department of Education, 2015).

Purpose of the Study

The purpose of this study was to examine the perceptions of a sample of teachers in northwestern New Jersey on the effectiveness of current professional development addressing the successful integration of technology into the classroom. This study illustrates the perceptions of teachers regarding the current technology usage level serving to evaluate the current level of teacher perceptions concerning professional development training in technology perhaps as the basis for planned improvements for technology education in the state of New Jersey. Existing professional development opportunities include workshops, in-service training sessions, online coursework, peer coaching, and job-embedded professional development (Boston Consulting Group, 2014; Cooper, 2014; Robertson, 2011; State of New Jersey, 2013; Turner & White, 2015). Technology specific professional development is often offered through online courses, peer coaching, and product specific training for technological devices or programs (Boston Consulting Group, 2014; Cooper, 2014; State of New Jersey, 2013).

The purpose of this study was to investigate whether teachers' perceptions of the effectiveness of professional development in technology use changed depending upon their years of experience, highest degree level earned, or self-proclaimed level of experience with technology. Although 95% of teachers indicated that they had some level of training in

technology use in the classroom, 48% reported that they desired to learn more about integrating technology into the classroom (Bolkan, 2015). If teachers are to become proficient and improve their ability to integrate technology into the curriculum, extended, effective professional development in technology must be offered to them.

Many factors may contribute to this problem; among them are old and outdated equipment, unusable equipment, and the lack of effective professional development in the use of technology in the language arts classroom. Additionally, contributing factors include teacher self-efficacy, teacher experience level with technology, and teacher confidence in their ability to use technology effectively in the language arts classroom. Computer usage in schools has been identified as minimally improving writing scores and not overall student achievement based on the level of technology integration present (Campuzano, Dynarski, Agodini, & Ral, 2009; Goodwin, 2011). Just as teachers are expected to use data to drive instruction, administrators need data to assist with decision making regarding best practices for professional development. Teachers must be technologically proficient and able to integrate technology into the curriculum if they are to incorporate the national technology plan effectively.

Social constructivism is the theoretical lens that was used to focus this study. The research methodology for the study was a quantitative study of preschool through eighth grade teachers in elementary schools located in northwestern New Jersey. Examined for this study was preschool through eighth grade teachers' perceptions of the professional development provided in efforts to improve the current level of technology use in the classroom. This researcher investigated whether teachers' perceptions about the professional development offered to improve the current level of technology use were different based upon their years of experience, highest degree level earned, or self-proclaimed level of experience with technology.

Research questions were developed to investigate teacher perceptions of professional development training on the methods for improving the use of technology in the classroom. Determining teachers' perceptions of professional development regarding use of technology in the classroom may be beneficial in assisting school districts with decisions regarding how to spend technology budget dollars. The information gathered may help school district administrators make recommendations related to assisting teachers in using educational technology effectively in similar public school classrooms.

A myriad of barriers affects the process of successfully integrating technology into the classroom, including gaps in professional development, low teacher self-efficacy, technology limitations, and budgetary concerns, as indicated in prior research (Martin et al., 2010; Penuel, 2006; Wolf, Lindeman, Wolf, & Dunnerstick, 2011). An additional barrier to the successful integration of technology into the classroom is that the rush to increase technology in school districts has left little time for a focus on how to use technology to enhance student performance (Anderson, 2009; Young & Bush, 2004). Teachers receive no clear direction regarding the use of technology in the classroom, leaving many to regard computer usage by students as an afterthought rather than placing it firmly within the curriculum (Brown, 2014; Young & Bush, 2004). School districts increase the quantity of technology without assisting teachers in understanding the ways in which technology usage within the classroom helps students to reach curricular goals or why teachers should use technology in this manner (Dede, 2014; Erişti et al., 2012; Young & Bush, 2004).

Recognizing methods of improving the use of information and communication technology to enhance student achievement will benefit all the stakeholders in education, especially teachers and students. The pedagogical needs of the students must be considered

before using technology to advance student achievement (Young & Bush, 2004). Armed with information about the conditions teachers perceive as necessary for integrating technology into the classroom, school district administrators will be better able to meet the needs of their staff.

Research Questions

The research question studied was: To what extent, if any, do teachers perceive professional development related to the successful integration of technology into the classroom as effective? Evaluated was the need for improved professional development in technological literacy to facilitate the integration of technology into classrooms. The following research questions evaluated professional development in the form of technology integration.

1. To what extent, if any, is there a statistically significant difference among teachers grouped according to years of experience and the teachers' perceptions of the effectiveness of professional development as related to the successful integration of technology into the classroom?

   $H1_0$: There is no statistically significant difference among teachers grouped according to years of educational experience and the teachers' perceptions of the effectiveness of professional development as related to the successful integration of technology into the classroom.

   $H1_1$: There is a statistically significant difference among teachers grouped according to teachers' years of educational experience and the teachers' perceptions of the effectiveness of professional development as related to the successful integration of technology into the classroom.

2. To what extent, if any, is there a statistically significant difference among teachers grouped according to the teachers' highest degree level earned and the teachers'

perceptions of the effectiveness of professional development as related to the successful integration of technology into the classroom?

$H2_0$: There is no statistically significant difference among teachers grouped according to teachers' highest degree level earned and the teachers' perceptions of the effectiveness of professional development as related to the successful integration of technology into the classroom.

$H2_1$: There is a statistically significant difference among teachers grouped according to teachers' highest degree level earned and the teachers' perceptions of the effectiveness of professional development as related to the successful integration of technology into the classroom.

3. To what extent, if any, is there a statistically significant relationship between the teachers' self-assessed technology usage and the teachers' perceptions of the effectiveness of professional development as related to the successful integration of technology into the classroom?

   $H3_0$: There is no statistically significant relationship between teachers' self-assessed technology usage and the teachers' perceptions of the effectiveness of professional development as related to the successful integration of technology into the classroom.

   $H3_1$: There is a statistically significant relationship between teachers' self-assessed technology usage and the teachers' perceptions of the effectiveness of professional development as related to the successful integration of technology into the classroom.

Rationale, Relevance, and Significance of the Study

A review of the literature provided a basis for collecting information about teachers' perceptions of professional development to integrate technology in the classroom. Administrators use data to assist with decision making about best practices for professional development. This study benefits school districts seeking to employ effective professional development to integrate technology into the classroom. School districts may use the results of this study to assist them in making decisions about professional development opportunities about the use of technology and enhancing the integration of technology into the classroom.

This study is significant because it may assist school districts in determining the appropriate type of effective professional development for assisting teachers as they integrate technology into the curriculum to enhance the academic experience and encourage the educational development of their students. These students are tested on computerized standardized tests that determine their academic standing and establish a rating for their teachers and school districts based on their test scores. The students' ability to effectively, capably use the computer to navigate successfully through the high-stakes test reflects upon their technological proficiency. The empirical significance of this study is that it provides assistance for school districts looking for direction about providing the required professional development.

There were 1,879 certified teachers employed in northwest New Jersey invited to participate in the survey via email. Using an a priori sample size calculator for *t* tests (Soper, 2016), it was determined that to achieve the anticipated effect size of 0.5 with a desired statistical power level of 0.8 and a probability level of 0.05, the minimum sample size for a two-tailed hypothesis was 128 participants. The actual response was 118 surveys with 97 marked as finished by Qualtrics Software.

School districts benefit from determining the method of professional development best suited to the demographic makeup of their staff members based on the results of this study. Educators show a preference for certain types of professional development that may be more cost effective than others for the school district (Boston Consulting Group, 2014; Cooper, 2014; Hennessy & London, 2013). Continuing to use ineffective professional development will not improve the integration of technology into the classroom and therefore will not improve the chances of students' becoming college and career ready and therefore able to compete in a global society. School districts can provide the best practices for ongoing, effective professional development that meets the needs and specifications of their staff members as they work to integrate technology into the classroom to improve student achievement.

A quantitative survey method was used for this study based on two pre-existing surveys with Likert scale categories and several demographic questions. Using this scale allowed conclusions to be drawn based on the statistics and an analysis of the variables in the survey to be developed. Using a survey enabled the researcher to discern the differences among teachers' perceptions of the effectiveness of professional development related to integrating technology into the classroom. The reliability and validity of the survey instrument was considered before the two surveys, The Locator Self-assessment for Teachers survey (EdTech Locator for Technology Implementation, 2009) and The Quick Teacher Technology Usage Survey (PowerUp What Works, n.d.), were selected.

The surveys used in this research were developed with extensive research financed by federal grant funds from the United States Department of Education. The Quick Teacher Technology Usage Survey (PowerUp What Works, 2015) and The Locator Self-assessment for Teachers survey (EdTech Locator for Technology Implementation, 2009) are among the

resources available online at PowerUp What Works (2015). This federally funded website was designed to meet the needs of school districts in addressing Common Core State Standards as they relate to technology (PowerUp What Works, 2015). These survey instruments are used in school districts across the country to reliably survey staff members with the purpose of making recommendations for the integration of technology into those school districts, according to the Center on Technology and Disability (CTD, 2015).

All school district administrators in northwestern New Jersey with the e-mail addresses available at the State of New Jersey Department of Education data records were contacted requesting that they forward the survey invitation to all certificated staff members in the school district. The purpose of the study, participants' rights as human subjects, an assurance regarding the anonymity of the survey results, and potential risks involved were printed on the opening page of the online survey via Qualtrics Software. To continue to the survey questions, the subject had to agree to participate; failure to agree brought the subject to a closure page identifying the end of the process. The researcher compiled and analyzed the data provided in the completed surveys with the Qualtrics Survey, Microsoft Excel, and IBM SPSS Statistics 24, examining differences in perceptions among respondents. The researcher proposed that the analysis helps school district administrators to understand the perceptions of teachers regarding the effectiveness of professional development related to integrating technology into the classroom to provide effective, ongoing learning opportunities for teachers.

Nature of the Study

The data collected for the study included information regarding teachers' perceptions of the effectiveness of professional development for improving the current level of technology use. Minimal research can be found that combines the factors of teacher years of teaching experience,

highest degree level earned, or self-proclaimed level of experience with technology and the factors' effect on teachers' perceptions of the effectiveness of professional development for integrating technology into classrooms. Age and experience with technology have been studied in previous research related to digital natives and digital immigrants, but the relationship between these factors and professional development needs additional study.

These variables are important for integrating technology into the classroom because they are vital factors to consider when planning professional development (Atjonen & Li, 2006; Koehler and Mishra, 2009; Roth, 2014). Considering the demographic makeup of the staff of a school district is important when selecting the type of professional development that will be effective for successfully training the educators (Atjonen & Li, 2006; Koehler and Mishra, 2009, Roth, 2014). School districts can use the results of this study to improve professional development opportunities concerning the use of technology and enhancing the integration of technology into the classroom. Administrators may use the information gathered in this study in decision making that supports the teaching population with professional development for the improved use of technology to enhance learning in the classroom. This study may provide useful information for school leaders regarding these factors and their relationship to the integration of technology into the classroom.

Definition of Terms

Administrator. An administrator is an employee of a school district who holds a certificate that indicates the person is qualified as a supervisor and is responsible for making decisions regarding hiring, purchasing, and providing services (New Jersey Department of Education, 2014b).

Professional Development. Professional development shall refer to the teacher training programs of any format offered by the school district with the intention of providing learning experiences for staff (Jao & McDougall, 2015). Fullan (1991) defines professional development as "formal and informal learning experiences from pre-service teacher education through one's entire career to retirement" (p. 326).

Teacher. A teacher is a person who holds an instructional certificate issued by the state indicating that she or he has met the educational, testing, and practicum requirements of certification as an educator (New Jersey Department of Education, 2014a). For this study, the word *teacher* shall refer to any certificated educator working with students in an educational setting.

Technology. Technology is often explained as any human-developed change to the natural state of the world; for the purposes of this study, it will be defined as any tools, instruments, or equipment used to communicate, inform, or solve problems.

Digital Literacy Coach. A digital literacy coach provides support, assistance, and training for school personnel with ongoing, effective instruction throughout the school year (Grashel, 2014).

Technical Personnel. Technical personnel deal with issues that arise from the use of their school's networks, programs, or websites but not necessarily the pedagogical aspects of technology (Grashel, 2014).

Age and teaching experience will be measured in whole years for the purposes of this study. Self-determined level of technological usage refers to the individual's evaluation of his or her own ability to use technology. *Teaching assignment* is the job or position that the educator holds within the school, for example third grade teacher or language arts teacher.

Assumptions, Delimitations, and Limitations

Assumptions. Sources of error include assumptions about the mood, attitude, and current state of emotions of the participants as they respond to the survey because this can affect the responses (Nulty, 2008). It is assumed that during this study, participants' gender did not significantly affect their perceptions. Possible sources of error include false or incomplete responses given if the participant believes her or his school district administrators have an opportunity to view the responses given and that the answers may not be completely anonymous (Beskow, Check, & Ammarell, 2014).

Despite the promise of having safeguards in place to protect anonymity, research shows that study participants are concerned with confidentiality (Beskow et al., 2014). Teachers may not have properly completed the survey because it took too much time or effort (Nulty, 2008). Other sources of error include misunderstanding the questions or the response options, lack of experience with various methods of using technology, or attitude toward technology in general (Kouchaki, Okhuysen, Waller, & Tajeddin, 2012). The Quick Teacher Technology Survey (PowerUp What Works, n.d.) and the Locator Self-assessment for Teachers survey (EdTech Locator for Technology Implementation, 2009) are accurate measures of the perceptions of teachers regarding the integration of technology into the classroom. This research was a descriptive quantitative study of school educators ranging from teachers of preschool through eighth grade in northwestern New Jersey school districts.

Delimitations. The subjects of this study are delimited to preschool through eighth-grade teachers working at school districts in northwestern New Jersey. Teachers from these school districts were selected for participation in this study based on geographic location, availability, and agreement to take part. To keep the identities of the school, teachers, and

students private, this researcher did not use the name of the schools, and each educator will be anonymous. The data collection took place during a limited time and the information gathered is specific to that period. A viable survey instrument must be well designed to provide researchers with the data they need and to reduce the potential for errors.

Limitations. Although this study had a small population size consisting of 1,879 teachers in northwestern New Jersey who were invited to participate, this researcher had the opportunity to survey teachers in different grade levels from school districts in different District Factor Groups (DFG). This sample and the analysis offers insight into the varying relationships with technology that coexist within school districts. The responses of those who participated in the study may differ from the responses of those who chose not to participate. In the present study, the researcher acknowledges that the sampling is a limitation for any generalization of the findings (Patton, 1999). The data collected are specific to this geographic area and these teachers, and caution should be exercised when applying this information to other school districts and educational settings.

Because the study involved decisions made by the school district, respondents may not have answered survey items frankly, even though the survey was completed anonymously. Additional limitations include inherent errors in the survey, including wording and delivery. Teachers may have had experience with technology outside of the classroom, and this may have affected their ability to answer the survey questions specifically regarding information gained through professional development opportunities. Although they may have had experience with using technology, teachers are not always digitally literate or skilled at keyboarding, which can affect the outcome of the surveys or the desire to complete an online survey.

Summary and Transition

The researcher presented a discussion of the problem studied and the background information necessary to explain the purpose of the study. In this chapter was a discussion of the primary research questions, the hypotheses, and the research design. In the next chapter, the researcher presents a review of literature to provide a critical summary of current research regarding the problem studied.

This study investigated teachers' perceptions of the effectiveness of professional development related to integrating technology into the classroom to find the baseline from which the task force legislated by the State of New Jersey can operate. The researcher studied whether years of experience, highest degree level earned, or self-proclaimed level of technology usage of the participant affected the perception of teachers regarding methods of improving the use of technology that were perceived as effective in enhancing the integration of technology into the classroom. The results of the study examined teachers' perceptions of professional development in regard to improving the use of technology to enhance the integration of technology into the classroom. Findings included information regarding teachers' perceptions of the professional development methods regarding improving the use of technology in the classroom.

Data regarding teachers' perceptions of professional development aimed at integrating technology into the classroom were analyzed, along with a variety of subgroups based on years of teaching experience, highest degree level earned, and self-assessed technology usage levels. Data were analyzed using correlation coefficients, which measure the relationship between two variables in interval scales. Studying frequencies assisted the researcher with identifying relationships between variables. The results of this study may provide school districts with information regarding educators' perceptions of professional development intended to improve

the use of technology in the classroom. Based on this information, similar school districts may be better equipped to meet the needs of their teachers charged with integrating technology into the classroom.

Chapter 2: Literature Review

The Common Core State Standards are a set of guidelines for the knowledge and skills necessary for students to be college and career ready so they are capable of living and working in a global society (Achieve, 2013; ACT, 2008; Dede, 2014; Gorlewski, 2013). These standards were developed as part of an educational accountability reform designed to hold teachers accountable, to raise student achievement expectations, and to improve student skills in the area of technology usage (Achieve, 2013; Dede, 2024; Gorlewski, 2013; Kee et al., 2012; National High School Center, 2011). There is a need for teachers to be well versed on helping students meet the technology usage and digital literacy requirements as set out by the government to maintain our position in this global society (Gorlewski, 2013).

The State of New Jersey Department of Education stipulates that teachers have a minimum of twenty hours of professional learning experiences per school year to develop teacher practice and skills that improve student achievement (State of New Jersey, 2013). Effective professional development helps teachers as they connect technology to the curriculum with a basis in educational standards (Penuel, 2006). New legislation introduced in New Jersey requires that teachers receive effective professional development to enable them to integrate technology into the classroom and provides for a task force to evaluate that this process occurs (New Jersey Assembly, 2015). The format of professional development used varies by school district, administrators, and staff, including job-embedded professional development, digital literacy coaching, online coursework, workshops, and in-service training sessions (Boston Consulting Group, 2014; Cooper, 2014; Robertson, 2011; State of New Jersey, 2013; Turner & White, 2015).

New Jersey legislation called for the creation of a task force to determine the changes necessary for professional development to better address the needs of both teachers and students regarding technology use in the classroom (New Jersey Assembly, 2015, para. 1). The results of this study could provide the ground work for the task force to study professional development as related to the integration of technology into the classroom. The literature search conducted for this study did not identify any research gauging the current level of teachers' perceptions of the effectiveness of professional development in New Jersey prior to the introduction of the legislation to improve professional development (New Jersey Assembly, 2015, para 1). The results of this study provide a baseline to examine perceptions of New Jersey teachers of professional development as related to integrating technology into the classroom and whether it was different based on the makeup of the staff.

The students' level of proficiency with computer skills and digital literacy is assessed directly in New Jersey as students take the Partnership for Assessment of Readiness for College and Career (PARCC) standardized exam online (Clark, 2016; Herold, 2016). The State of New Jersey currently uses the New Jersey Student Learning Standards and the standardized online assessments created by the PARCC (Achieve, 2013; Clark, 2016; Herold, 2016). New Jersey's students will not be able to adequately display their language arts and mathematics knowledge on the computerized PARCC tests without proficient computer skills (Clark, 2016; Herold, 2016).

The New Jersey Student Learning Standards provide expectations for what students are to learn about technology and the implementation of these standards in 2014 required school districts to deliver learning opportunities for all students in technology (State of New Jersey, 2014d). These standards were applied in 2014 (State of New Jersey, 2014d), however, less than 53% of New Jersey students in grades three through eight scored at the proficient level using a

computer to complete the PARCC administered in 2015 (State of New Jersey, 2016a; State of New Jersey, 2016c). The Senate and General Assembly of the State of New Jersey recognize the importance of effective, appropriate professional development for integrating technology into the curriculum. The legislators enacted a bill to investigate issues, including the application of technology standards, and to make recommendations regarding the use of technology in schools (New Jersey Assembly, 2015).

The conceptual framework for this study was based on the technology proficiency requirements both teachers and students must meet, as set by the United States Department of Education. The Blueprint for Learning (United States Department of Education, 2010a) calls for professional development to improve student learning using resources and materials that are aligned with the college and career readiness standards. If teachers are to become proficient and improve their ability to integrate technology into the curriculum, they must receive extended, effective professional development in technology (Boston Consulting Group, 2014; Broussard, 2009).

Social constructivism is the theoretical lens used to focus this study, and professional development is the disciplinary aspect used to support this study. Constructivist theory asserts that the starting point for instruction is not the new knowledge, but the prior knowledge, past experiences, and interests of the learners (Robertson, 2011). The learners' knowledge comes from prior "experiences, backgrounds, and beliefs, all of which are unique specific to the individual yet grounded independent upon social situations," according to social constructivist theory (Robertson, 2011, p. 10). Current education theories are based on knowledge scaffolding, like the social constructivism theory which focuses on critical thinking, meaningful reflection, and social interaction (Almala, 2005).

The argument pattern is sample to population; the sample should represent the consensus of the entire population of educators in the northwestern region of the state of New Jersey. This argument pattern uses the logic that what is true to the sample is true to the whole population (Machi & McEvoy, 2016). A disparity between the format of professional development that districts focus on and the format the teachers believe is helpful may indicate a problem (Boston Consulting Group, 2014). Although the National Education Technology Plan (United States Department of Education, 2010) calls for effective professional development for teachers in order to integrate the technology plan, the success or failure of the infusion of technology into the classroom cannot be precisely determined (Gao et al., 2009; Kay, 2006; Wozney et al., 2006). In order for teachers to become proficient and improve their ability to infuse technology in the curriculum, there is a need for extended, effective professional development in digital technology (Broussard, 2009; Kee et al., 2012). Many teachers feel unprepared to use technology effectively for classroom instruction (Broussard, 2009; Latio, 2009).

If schools are to increase the current use of technology and integrate technology into the curriculum, they must identify teachers' perceptions of professional development that is aimed at improving the use of technology in the classroom and the barriers that keep this from happening. This study explored teachers' perceptions of the effectiveness of professional development that addresses technology use in the classroom. The research question was formulated in an attempt to determine to what extent, if any, teachers' perceptions of professional development about methods for improving current use of technology in the classroom differed from one another.

Significance of Study

This study is significant because preschool through eighth-grade education systems struggle with great technological changes. Preparing students for life in high school and beyond

is more challenging than ever before, as students must to be able to read, write, calculate, and think critically. They should have a good knowledge of history, cultures, social sciences, sciences, and health-related concerns. They need to develop skills in problem solving, communication, and computer and technology applications, as well as learn how to motivate themselves to embrace lifelong learning. Without these fundamental skills, students may not be able to compete in a global society.

This review of the literature covers a comprehensive discussion of the need for more effective methods of professional development for K–8 teachers on using technology to bring technology into the classroom, which supports the study's problem statement and research question. The review includes a discussion of the Common Core State Standards, digital literacy, professional development, and a review of standard K–12 school technology expenditures. The researcher identified in this chapter the foundational learning and cultural aspects that influence preschool through eighth-grade school district personnel and organizations. It defines and describes the use of technology in the schools and establishes the types of training necessary to assist teachers as they work to help their students to become technologically proficient and digitally literate. This study was conducted to analyze data from the responses of teachers to determine their perceptions of the effectiveness of professional development to improve current use of technology for integrating technology into the classroom. At the end of the study, the participant responses from educators were analyzed and evaluated.

Conceptual Framework

The framework for this study is based on social constructivism and investigated educators' perceptions about ways in which technology might better be used to integrate technology into the classroom. Current paradigms in education have changed from being based

in generalizations, facts, definitions, and procedures to concepts such as meaningful reflection, problem solving, social interactions, and critical thinking (Almala, 2005). Constructivism is the basis for understanding the way adults learn from their experiences (Almala, 2005; Merriam & Bierema, 2014). Social constructivism is the assumption that individuals want to understand the world they live and work in. Constructivism ranges from the cognitively based findings of Piaget to the social constructivism of Vygotsky (Merriam & Bierema, 2014). Social constructivism is a variation of constructivism that emphasizes the collaborative nature of learning. The research study that this researcher conducted depends upon the educators' views of the situation that this researcher studied, making it a clear example of social constructivism.

Currently, there is a need for ongoing, effective professional development to improve the current use of technology in the classroom in such a way that enables the students to become digitally literate and proficient in the use of technology in all subject areas, in a variety of ways. Teachers should be able to instruct students about information and communication technologies in a manner that leads to the students' becoming proficient. The effectiveness of the technology depends on the teacher's technological ability, how the technology is integrated into the curriculum, and how the technology is individualized for each student (Okojie & Olinzock, 2013; Roth, 2014). Teachers must be able to meet an appropriate level of technical information and communication instruction for students (Okojie & Olinzock, 2013; Roth, 2014).

Teachers' professional development must prepare them for their changing role: offering students digital literacy skills in information and communication technologies so that they are prepared to live and work in the 21st century (Okojie & Olinzock, 2013; Roth, 2014; Wolf et al., 2011). The greater community—the state, businesses, professional organizations, educational institutions, and local community members—also affect the school's social community (English,

2011; Epstein, 2011). Social constructivist theory supports collaboration and peer coaching where teachers plan, share, and reflect together to encourage one another to attain a greater level of understanding and development of knowledge and skills (Crotty, 2010; Gilakjani, Leong, & Ismail, 2013; Zyad, 2016). Additionally, adult learning theory is a basis of this study in that adults learn differently than children and are more intrinsically motivated than children are (Alajlan, 2015; Knowles, Holton, & Swanson, 2015). Prior to the development of andragogy theory, the study of adult learning, most learning theories were created and developed based on the way that children learn, which is inherently different from the way adults learn (Alajlan, 2015; Knowles et al., 2015).

Social constructivism explains that the social aspect of learning increases the level of ability at which students are able to complete tasks when working in collaboration with others (Almala, 2005; Crotty, 2010; Gilakjani et al., 2013; Zyad, 2016). Professional development for teachers is often provided in a group setting with different formats of learning opportunities in collaboration with colleagues (Boston Consulting Group, 2014; Dindar, Kurt, & Erişti, 2012; Thompson, 2015) Students need to be proficient in digital literacy and the use of technology to be college and career ready. The skills, abilities, maturity, and goals of students contribute to their success in the future. College and career readiness "refers to the content knowledge and skills high school graduates must possess in English and mathematics—including, but not limited to, reading, writing communications, teamwork, critical thinking, and problem solving—to be successful in any and all future endeavors" (National High School Center, 2011, p. 4). It is understood that college and career readiness goes beyond reading and math and includes a broader-based high school education that includes developing and practicing study skills and work habits (National High School Center, 2011).

Paradigms in research include constructivism, positivism, transformativism, and pragmatism (Crotty, 2010). A paradigm is a framework of generally accepted beliefs and perceptions about a subject. A paradigm helps to determine the approach researchers choose to take, whereas a research approach refers to a way of doing research. Approaches refer to designs, to methods of data collection or analysis. In time, a research approach could become a paradigm. Many accepted paradigms were once approaches taken in research that have proven themselves over time.

Social constructivist theorists explain that the social aspect of learning increases the level at which students are able to complete tasks when working in collaboration with others and that constructivism is a framework for technology in education (Gilakjani et al., 2013; Zyad, 2016).

Review of Research Literature and Methodological Literature

The review of the literature for this study focused on the teachers' ability to instruct students and help them to become proficient in digital literacy and the use of technology so that they will be college and career ready. Conley (2013) indicated that two categories of "key learning skills and techniques are student ownership of learning and specific learning techniques and strategies" (Kindle Locations 1379). Student ownership of learning is demonstrated by several characteristics, including setting goals, time management, self-motivation, self-efficacy, and perseverance (Conley, 2013). Specific learning techniques and strategies include "study skills, test-taking skills, note-taking skills, memorization and recall techniques, strategic reading, collaborative learning, and technology skills" (Conley, 2013, Kindle 1381–1383). Schools embed these key learning skills into the curriculum and instruction of all subject areas because they are important and useful for students. Students need to practice dedication, goal setting, organization, and technology skills to attain college and career readiness.

To ensure that students receive the guidance needed to improve their technology skills, teachers must have the professional development in technology necessary to raise their comfort level with technology equipment; without that comfort, teachers will have difficulty integrating technology into the classroom effectively (Wolf et al., 2011). Coordinators of professional development should instruct teachers in the use of the technology available in the school district so that they are able to use the technology properly, appropriately, and effectively within the classroom (p. 560). Classroom experiences should include rich experiences with new and different technologies to prepare them for the future that has yet to be invented (p. 560). Successful integration of technology into the classroom is linked to effective professional development that helps to connect technology to the curriculum with a basis in educational standards (Penuel, 2006).

Common Core

Educators and administrators are working through issues that have arisen with the implementation of the Common Core, but these standardized assessments create further issues related to the digital literacy of educators and students. The adoption of the Common Core Standards and with it, the adoption of online computerized standardized tests, created a need for students to be digitally literate and to know how to use technology. Regardless of the knowledge and information the students may possess, if they are unable to use the technology necessary to complete the computerized online standardized assessments, they will not be as successful (Herold, 2016). The state of New Jersey has adopted the New Jersey Student Learning Standards and the standardized assessment created by the PARCC (Achieve, 2013). Given the multiple changes in curriculum, it is time to explore the key components necessary for standardized online assessments to be implemented in a manner that allows for student success.

At face value, the Common Core standards seem to focus mostly on language arts and math, however, the Common Core addresses the other disciplines and recognizes their contribution to student success (Chaffee & Gullen, 2013, p. 25). As educators work to ensure the appropriate implementation of the Common Core, the standardized assessments create further issues regarding digital literacy of educators and students.

Computerized Standardized Testing

The United States is currently undergoing educational reform with a push toward computerized standardized testing. The form and format of standardized testing has changed little over the years. Dietel (2012) discusses the lack of change in assessments, including the traditional 'number two pencil,' paper fill-in the bubble multiple-choice test, and he mentions some new developments like the online summative assessment. Computerized standardized testing is under growing scrutiny for its use to evaluate students, teachers, and schools, as well as students. With increasing computer use in all aspects of life, the implementation of computerized standardized testing is not surprising.

The rollout of nationwide trials of computer assisted standardized testing began in 2013, with nationwide implementation in 2014 (Achieve, 2013). There are potential problems, concerns, and issues associated with the average school district implementing computerized standardized testing (Achieve, 2013). Education stakeholders have differing opinions on the validity of high-stake testing and the amount of importance that should be attached to student test scores. While heralded as a welcome improvement to standardized testing by some, computerized standardized testing does include misconceptions, problems, and expense.

The State of New Jersey selected the PARCC (Achieve, 2013) test to administer to the students to assess their knowledge. This test is available completely online and is a summative

assessment of the students' learning throughout the school year. Until 2014, students completed assessments on paper, filling in the bubbles with number two pencils, being careful not to go outside the lines or erase any stray marks. Teachers administered tests like these for years, with the eventual addition of open-ended questions, short constructed responses, and full writing prompts. Today the use of computerized tests is ubiquitous. To ensure a successful, reduced-stress experience, students must be appropriately prepared with technology skills and abilities they need (Clark, 2016; Herold, 2016). To gather valid students' scores and to understand how to use the data gathered, educators must have additional assistance and professional development to be able to correctly oversee and manage computerized testing, conduct data analysis, and use data to drive instruction (Dede, 2014; Erişti et al., 2012; Kee et al., 2012; Okojie & Olinzock, 2013, Roth, 2014; Thompson, 2015).

State School District Standards

The State of New Jersey and local school districts located in New Jersey have specific requirements for certified educators, some of which include teacher evaluations, data recording, and lesson plan formats. New Jersey has been ranked as the top overall school system in the country and is second for education output and safety (Napoliello, 2014). The students' level of proficiency of computer skills and digital literacy is directly assessed by the State of New Jersey. The State of New Jersey abandoned the Common Core Standards and recently adopted the New Jersey Student Learning Standards with the intention of still assessing students with the PARCC assessments (Achieve, 2013).

Three separate assessments are scheduled for fourth-grade students in New Jersey, including the online PARCC exam (Achieve, 2013), the NJ Ask Science exam (State of New Jersey, 2014), and the NAEP. Without basic computer skills and digital literacy, New Jersey's

students will not be able to adequately display their language arts and mathematics knowledge on the online PARCC tests. Common Core lessons, teacher evaluation requirements, formative and summative assessments, and the preparation necessary to facilitate the online standardized tests are concerns for many teachers this school year (Achieve, 2013; Clark, 2016; Herold, 2016).

Digital Literacy

Many teachers have extensive knowledge of the educational process, the content they teach, and their students' learning styles. However, some teachers do not have extensive experience with intentionally using technology on a daily basis to benefit their students' learning. Eshet-Alkalai and Chajut (2010) studied whether improvement in digital literacy skills over time was related to the teacher's age or experience with technology, comparing participants' scores in two studies conducted 5 years apart. After the researchers compared scores from 2002 with those from 2007, they found an increase in digital literacy skills among teachers for both the age group and the control group (p. 178).

Eshet-Alkalai and Chajut (2010) compared the results of two studies evaluating the digital literacy of groups of people, with age and experience being the variables. Three age groups were included in the studies, with 10 males and 10 females in each set: one group from the local high school, one from the local college, and one group of 30–40-year-old college graduates (p. 175). All participants had computer experience, and the norm is that experience increases with age; however, in this study, the authors found that the younger participants had more experience (p. 175). The authors illustrated that using technology helps to improve digital literacy irrespective of the age of the person using the technology (p. 178). Eshet-Alkalai and Chajut claimed that the older population gains skills in using technology in everyday life and that it is the experience with technology rather than age that improves digital literacy skills (p. 176).

If the experience of using the technology assists instructors in integrating digital technologies into their instruction, then allowing opportunities for training and reflective practice in technology in K–8 schools may be a significant advantage for both administrators and teachers. Teachers need to understand and be able to determine the best technology tools and applications to use and must know why these tools and applications are beneficial for student learning (Dede, 2014; Erişti et al., 2012; Kee et al., 2012; Okojie & Olinzock, 2013, Roth, 2014; Thompson, 2015).

Technology and Technical Personnel

The National Center for Educational Statistics (NCES) surveys school districts to collect information about the technology available in schools and how it is used. The results of the 2010 survey indicate that only about 30% of schools have an employee who is dedicated to the implementation and support of technology (Gray, 2010, p. 3). The survey identified that almost twice as many secondary schools had an employee dedicated to the implementation and support of technology as compared with elementary schools, of which only 27% had this position (p. 3). The poverty concentration in the school district also affected the likelihood of schools' having such employees on staff (p. 3).

Although the 2015 NCES report gives significant data about technical personnel, it does not segregate the duties of the technical personnel. For example, some personnel may not interact with teachers and might be dedicated to server, network, and equipment maintenance while others may collaborate with educators in K–12 schools. For purposes of this study, the terms *digital literacy coach* and *technical personnel* designate two different professional positions in K–8 schools. A digital literacy coach provides support, assistance, and training for school personnel with ongoing, effective instruction throughout the school year (Grashel, 2014).

Technical personnel deal with issues that arise from the use of their school's networks, programs, or websites but not necessarily with the pedagogical aspects of technology (Grashel, 2014; Unger & Tracey, 2013).

Technical personnel in school districts take on many roles. Network administrators control the software programming of the network servers to maintain the school network, Intranet, and Internet. Technology personnel maintain telephone systems, copiers, and public-address systems. Some technology specialists install hardware used in school districts, including computers, interactive whiteboards, document cameras, projectors, and other technologies used (State of New Jersey, 2014a). Technical support personnel deal with issues that arise from the use of their school's technology equipment and applications (Grashel, 2014). There are several positions in school districts that deal with technology issues, policies, and implementation, but many do not deal with pedagogical technology, integrating technology into the curriculum, or improving student achievement using technology (Grashel, 2014; Unger & Tracey, 2013).

Technology Use in the Classroom

A survey published by the Public Broadcasting System (PBS Learning Media, 2013) found that 91% of teachers have computers available to them in their classrooms but about 80% believe they do not have an appropriate level of technology (para. 1). In 2009, "97 percent of teachers had one or more computers in their classrooms every day, while 54 percent could bring computers into the classroom" (NCES, 2015, para. 2). According to responses to the survey administered by NCES (2015), Internet access was available for almost all the computers at the disposal of the teachers (para. 2). NCES reported that the student-to-computer ratio was about five to one, with teachers reporting that teachers or students used technology in classrooms during instructional time almost one-third of the time (para. 3).

Generally, less than half of the teachers surveyed had projectors, less than 40% had interactive whiteboards, and about 65% had digital cameras accessible to them or in their own classroom daily (NCES, 2015, para. 4). Results of the survey indicated that "of the teachers with these devices available, the percentage that reported using it sometimes or often for instruction was about 75 percent for projectors, about 60 percent for interactive whiteboards, and almost 50 percent for digital cameras" (para. 4). PBS Learning Media (2013) found that regardless of grade level taught or demographics of their school community, teachers expressed the belief that technology enhances student learning—especially interactive whiteboards and tablet computers, although they are not as widely accessible as some other technologies. The teachers surveyed by PBS Learning Media found that the single greatest barrier to the use of technology in the classroom is the school budget.

The NCES survey also collected data indicating the level at which the school district personnel assisted teachers in infusing technology into the curriculum (Gray, 2010). Overall, district-level technology staff provided technical assistance almost 60% of the time, while teachers and school-level technology staff assisted to a major extent less than 30% of the time (p. 3). The survey results indicate that the income level of the school community affected the attitude toward the use of technology in schools (p. 3). Teachers in poverty-level schools self-assessed their training in using technology as sufficient almost 75% of the time, whereas teachers in wealthier school districts rated their technology training sufficient only about 60% of the time (p. 4). Almost 80% of teachers from poorer schools felt that administrators spent funds appropriately, whereas only 69% of teachers from wealthier schools expressed that opinion (p. 3).

According to a study commissioned by the Bill and Melinda Gates Foundation, few teachers believe that professional development is satisfactory or improving (Boston Consulting Group, 2014). This study comprised a combination of interviews and surveys of more than 1,300 stakeholders in education and was conducted in 2014 (p. 3). The participants included teachers, professional development coordinators, and other school employees with varying levels of technology experience (p. 3).

Although research has been conducted on teacher perceptions of effective professional development for the integration of technology into the classroom, previous research was developed primarily through a qualitative method and considered only a small number of teachers in specific situations (Clausen, 2007; Kurt, 2013; Song & Looi, 2012). Due to the recent introduction of legislation in New Jersey requiring the development of a task force to oversee the implementation of improved professional development for educators to assist in the integration of technology into the classroom (New Jersey Assembly, 2015), the need for baseline information regarding current professional development is apparent. The need for a study to determine the perceptions of teachers regarding the effectiveness of professional development as it relates to technology integration is clear.

Technology Expenses

The cost of implementing technology programs with appropriate tools, training, and support is a barrier to the effective implementation of technology in the classroom (Inan & Lowther, 2010; Kopcha, 2012). In the New Jersey Report on the Cost of Education, Dupree, Augenblick, and Silverstein (2008) recommended an average expenditure of $150 per pupil for technology for all school districts, regardless of population. The per-pupil recommendation for supplies and materials was $300, for student activities was $100, and for equipment was $50

(Dupree et al., 2008). The state of New Jersey also recommended having one library or media specialist on staff, as well as one technology specialist for small school districts and two for larger school districts with enrollments of 720 or more (Dupree et al., 2008).

Frohlich (2014) identified New Jersey as the third state in line for highest spending on education. New Jersey residents ranked second in terms of wealth with an average household income of almost $70,000 in 2012 (Frohlich, 2014). Frohlich identified New Jersey as having more educated adults than most other states, with almost 40% of adults over 25 holding at least a master's degree in 2012. Murphy (2014) projected that during the year 2014, "American K–12 schools will spend an estimated $9.94 billion on educational technology, an increase of 2.5 percent over last year, according to Joseph Morris, director of market intelligence at the Center for Digital Education," meaning those schools will be using about one-third of the technology budget to purchase computer hardware (para. 3). School districts have invested heavily in implementing technology hardware, software, and devices (Frohlich, 2014; Inan & Lowther, 2010; Kopcha, 2012).

However, unless teachers are ready to use these technologies and integrate them into their classrooms, the investment does not contribute to the advancement of student learning (Frohlich, 2014; Inan & Lowther, 2010; Kopcha, 2012). Professional development must focus on the pedagogy related to the technology put in place in the school districts (Dawson, Cavanaugh, & Ritzhaupt, 2006; Young & Bush, 2004). School districts' professional development budgets are based on projected expenditures (San Antonio, Morales, & Moral, 2011; Hardin, 2016). School districts are fiscally responsible and are accountable to their communities for the effective use of district funds (Hardin, 2016). The state of New Jersey, along with other states, mandates a specific number of training hours of professional development and continuing education in

specific subject areas (State of New Jersey, 2014b). Good teaching occurs when the needs of teachers are met with appropriate professional development (San Antonio et al., 2011; Cooper, 2014; United States Department of Education, 2017). Teachers improve their practice through reflection, training, and professional development.

Professional Development

Professional development was the disciplinary framework used to focus this study's design and methodology. Fullan (1991) defined professional development as "formal and informal learning experiences from pre-service teacher education through one's entire career to retirement" (p. 326). Professional development in the realm of technology integration and digital literacy is significant for teachers who may not be savvy in information and communication technology. Fullan (2011) explained that through professional development, a person can explore multiple approaches, experiment, and learn from experiences with practice, which is a powerful tool for change (p. 3). The brain learns best with practice (p. 115). Because of the manner in which the brain works, learning based on practice is successful, because people cannot completely control their thoughts, people are designed to connect with each other, and brains can be reshaped (p. 112).

Students today are digital learners interacting with technology at home, at school, and on the go with technologies in hand (Gurung & Rutledge, 2014). Often called digital natives, these students have the ability to use technology in an advanced way (Thomspon, 2013). Prensky (2001) explained that today's students have changed radically and are no longer the people the current educational system was designed to teach. Prensky gave the name *digital natives* to the first generation to grow up with digital technology, explaining that their brains work and process information differently from previous generations (p. 1). Prensky claimed that it is very likely

that their brains have changed due to the different experiences that they have had, which is an explanation very similar to the theory offered by Fullan (2011) suggesting that practice engages and reshapes the brain.

People best apprehend and retain information by using multiple senses. For this reason, daily practice and repetition is the best mode of learning (Fullan, 2011). Schools struggle to stay current with information and communication technology because students often have access to much more advanced technologies in everyday life and report that the technologies used in school are antiquated (Robertson, 2011). A common problem recognized in this country is the difficulty of using new technologies as they become available in school districts.

Professional development is necessary when school districts implement reforms, and "every year, school systems everywhere introduce myriad reforms—in curriculum or pedagogy, structure or governance, technology, and so on" (Stewart, 2012, Kindle Location, 1174–1175). Professional development is a priority in other countries, for example in Finland, where the school system ranks among the best in the world (Sahlberg, 2015). Sahlberg (2015) reported that

> According to a Finnish national survey, teachers devoted about seven working days per year on average to professional development in 2007; approximately half was drawn from teachers' personal time and about two-thirds of primary and secondary school teachers participated in professional development that year. (Kumpulainen as cited in Sahlberg, 2015, p. 17)

Finland uses teacher preparedness to raise student achievement rather than making schools and teachers more accountable for student performance. In Hong Kong, schools are encouraged to run their own professional development programs, focusing on collaboration and collegiality, to meet the individual needs of their teachers (Wong & Wong, 2000, p. 3). In Turkey, teachers use

technology on a limited basis, primarily for classroom management and as an extension of traditional teaching methods (Kurt, 2013). Younger teachers in Turkey use technology more regularly than do older teachers, according to Kurt (2013). Teachers in Turkey cite feeling inadequately prepared, lacking time, and being insufficiently supported as barriers to using technology in the classroom (Kurt, 2013).

A study in England concluded that effective professional development for teachers was necessary in order for interactive whiteboards to be considered beneficial to the classroom experience (Hennessy & London, 2013). The interactive whiteboard itself had no intrinsic value to the educational process without the investment of teacher time and professional development to incorporate its use into the classroom (Hennessy & London, 2013). Professional development activities are most successful when they are offered within the teachers' home school organization as continuous, reflective, and supportive practices (Hennessy & London, 2013).

Teachers improve their practice through reflection, training, and professional development. Cooper (2014) suggested that teachers will not teach well if they do not have appropriate professional development. Cooper noted that professional development includes "activities such as [having] teacher mentors and coaches, educational workshops, conferences related to teaching fields, teacher collaboration, and follow-up professional development training" (p. 47). Job-embedded professional development helps the teacher to improve the infusion of technology into the curriculum (Cooper, 2014; United States Department of Education, 2017). If they are to improve teaching and to benefit the students, professional development activities should be meaningful to the teachers and should fulfill their needs (Cooper, 2014; United States Department of Education, 2017). Just as students have different learning styles and diverse needs, when teachers are learning they also need professional

development that accommodates their learning styles, not a one-size-fits-all commodity. Cooper (2014) proposed that "as teachers have unique teaching and learning styles, curriculum directors, along with campus administrators should consider that a generic type of professional development may not meet the dire needs of all teachers, nor improve classroom instruction" (p. 65). Administrators hoping to improve the teaching skills of educators should include teachers in the planning process for professional development sessions. In New Jersey, several teachers must serve on the professional development committee for a school district to help to make the topics, activities, and methods more meaningful for the educators.

Job-embedded professional development (JEPD) is professional development that is cultivated in-house with and among teachers who are learning from and working with one another to advance the learning of their students in a school-specific manner (United States Department of Education, 2017). Professional development needs to progress from one-day training sessions to job-embedded professional development activities run by members of the teaching staff (Darling-Hammond, 2010; United States Department of Education, 2017). Professional development that is planned, effective, and ongoing increases teaching skills and improves student successes (Darling-Hammond, 2010; United States Department of Education, 2017). Darling-Hammond and McLaughlin explained that "job-embedded professional development (JEPD) refers to teacher learning that is grounded in day-to-day teaching practice and is designed to enhance teachers' content-specific instructional practices with the intent of improving student learning" (as cited in Croft, Coggshall, Dolan, Killion, & Powers, 2010, p. 2).

Job-embedded professional development creates a situation in which teachers can share their feelings about what they need to improve and can seek advice and assistance from others in a nonthreatening learning environment (Cooper, 2014; United States Department of Education,

2017). This format of professional development may encourage teachers to use new types of technology because immediate assistance is available as needed. Cooper (2014) claimed that the results of his study could benefit all members of the school community as job-embedded professional development improves instruction. The state of New Jersey, along with other states, mandates training hours of professional development and training in specific subject areas. Cooper postulated that "job-embedded professional development could enhance teachers' knowledge in their respective disciplines, eliminate teachers teaching in total isolation, and create a climate of collaboration among teachers" (p. 65).

Although K–8 teachers use computers for basic classroom management purposes, students often view their teachers as lacking the ability to use technology. Teachers report needing support and ongoing education to effectively use technology in the classroom (Atjonen & Li, 2006; Kee et al., 2012). Atjonen and Li (2006) pointed out that due to the diversity of teacher ages, education levels, and technological proficiency, offering successful professional development in the form of an in-service training is difficult.

Finding an appropriate level of experience for a training session that is meaningful and applicable for all members of a school staff is difficult because some may be digitally proficient while others rarely use a computer. The Bill and Melinda Gates Foundation contracted with Boston Consulting Group (2014) to attempt to discern barriers to effective professional development for teachers. The Boston Consulting Group found that although administrators and teachers generally shared the same description of effective professional development, they did not agree on the manner, method, and duration of implementation. The Group reported that only a small percentage of teachers expressed the belief that professional development was satisfactory, and few said they believed professional development was improving (p. 3). For

their study, the Boston Consulting Group contacted "1,300 teachers, professional development leaders in district and state education agencies, principals, professional development providers, and thought leaders through surveys and interviews" (p. 3). The consensus was that the manner in which the professional development was offered was inconsistent and did not truly represent what the administration intended or what the teachers experienced (p. 3).

The districts reported that more time should be spent on the forms of professional development they prefer, such as professional learning communities, lesson observation, and coaching new teachers; however, teachers were not satisfied with the manner in which these formats were delivered (Boston Consulting Group, 2014). For example, coaching was usually employed for new or underperforming teachers, offered mostly infrequently in an attempt to improve performance (p. 6). Teachers' responses indicated that teachers prefer professional development in the form of coaching by an educational professional trained in the subject area, experienced in reflective learning, and capable of providing beneficial feedback (p. 7). Most teachers viewed professional development as a time-consuming requirement rather than as a rewarding professional learning opportunity.

Digital Literacy Coaching

Incorporating prior knowledge, past experiences, and interest helps to encourage, promote, and improve technology usage and the acquisition of new knowledge. Constructivist theory asserts that the starting point for instruction is not the new knowledge, but the prior knowledge, past experiences, and interests of the learners (Robertson, 2011). The learners' knowledge comes from prior "experiences, backgrounds, and beliefs, all of which are unique specific to the individual yet grounded independent upon social situations," according to social constructivist theory (Robertson, 2011, p. 10). Neufeld and Roper (2003) found that common

forms of professional development do not help teachers to improve and enhance their own skills. Teachers reported that coaching helped them to be more reflective on their practice (p. 5).

Digital literacy coaches help teachers to integrate technology applications in their classrooms and to facilitate student technology proficiency by working in a personalized, reflective manner to provide the training and support that each individual teacher needs. After working with digital literacy coaches, teachers described an improved quality of work from their students as well as increased student engagement (Neufeld & Roper, 2003). Coaching is a more specialized form of professional development that is personalized for each individual and his or her specific experiences (p. 11). Digital literacy coaches provide support, assistance, and training for school personnel with ongoing, effective instruction throughout the school year. Additionally, Neufeld and Roper (2003) found that coaches want to experience professional development because they are eager to hone their skills as coaches.

The result of research by Cramer (2008) indicated that the support of the principal is essential if coaches are to perceive success. Principals showed their support by being actively involved in the coaching going on in their schools (Cramer, 2008). The schools that were most successfully implementing coaches were those with principals who believed they were part of the community of learners who benefited from the expertise of the literacy coaches (Cramer, 2008). When the coach and the principal work together as a team, the principal lets the teachers know that the coach is important, and that encourages the rest of the teachers to draw upon the coach's expertise (Cramer, 2008).

Successful school districts should maintain a continued endeavor of studying, reflecting, and improving the district's personnel. Successful leaders choose "clear, near, reachable goals and clear, orderly steps of problem solving, with clear expectations" (Schmuck, Bell, & Bell,

2012, p. 262). Improved communication and informed decision making will assist schools with the successful implementation of this type of plan (p. 133). A digital literacy coach should enjoy a social, symbiotic relationship with different members of the school community, including teachers, support staff, administrators, parents, and students.

Teachers need support when working with new technology, especially when introducing it to the classroom and daily use. Support in the form of personalized instruction and training encourages teachers to use technology regularly. School districts must provide a technologically supportive environment if they are to assist teachers in integrating technology into the curriculum. Holliday (2005) studied the use of technology coaches in the classroom and observed a significant increase in teachers' use of technology after teachers had received coaching.

Teachers reported that their average use of technology in the classroom increased from about one time per month to twice weekly after they received technology coaching (Holliday, 2005, p. 80). The more supportive an administrator is of the coach, the more highly regarded the coach is by the staff, and, as a result, the more likely the coaching program is to be successful (Cramer, 2008; Holliday, 2005). Coaching is an effective professional development model for supporting teachers who are using technology in the classroom. Holliday (2005) stated that her study confirmed that coaching offers teachers the support necessary to increase instructional use of technology.

An evaluation of the Microsoft Peer Coaching (MPC) program in Florida included an analysis of the MPC materials and attitudes and perceptions of the participants (Barron, Dawson, & Yendol-Hoppey, 2009). The participants, including teachers and supervisors from several Florida school districts, completed surveys on which they indicated that they had a generally

positive attitude toward peer coaching and the level of technology integration because of the MPC program (Barron et al., 2009). Two negatives indicated in the results were that the practice of peer coaching often took precedence over technology integration and that the lack of necessary investment in the program precluded the successful integration of technology (p. 90). Executed properly, an ongoing, sustained coaching program can assist teachers in integrating technology into the curriculum. With the implementation of a digital literacy coaching program, teachers would receive the technical support and personalized instruction necessary to improve their use of technology in the classroom.

The educational role of a coach in a school setting is much like that of an athletic coach, striving to take the performance to the next level (Neufeld & Roper, 2003, p. 9). Coaches encourage and support teachers in a way that professional development training or teacher evaluation systems do not. Coaches encourage educators to become better teachers through reflection, focus, and improving their practice (p. 9). A digital literacy coach and the school community members collaborate by working with and through technology using a variety of methods including professional development, policies, infrastructure, leadership, informational technology, and instruction.

In 2015, a school in Mobile, Alabama piloted a program to transform their media specialists into digital literacy media specialists working as technology coaches with members of the school community (Turner & White, 2015). In addition to working with students in the media center, the digital literacy media specialists worked with teachers to coach them in the use of technology and work in the classrooms with the teachers and students. Turner and White (2015) report that although the three-year program has only completed one year thus far, the district is "confident that the project is building the capacity of our teachers and digital literacy

media specialists to promote student achievement and prepare our students for success in college and career" (para. 19). Extending the role of school media specialists to assist teachers as coaches and technology leaders improved the learning experience for students (Turner & White, 2015). The media specialists can improve the learning environment for students by assisting teachers to develop a classroom learning experience with improved technology utilization and support (Turner & White, 2015). The role of the digital media specialist evolved to coach, co-teacher, and technology assistant which improved the student experience and allowed the teacher to delve deeper into the lessons that included technology usage while creating a more student-centered learning environment (Turner & White, 2015).

Teaching with Technology

Teaching using technology is complicated. It can mean using a plethora of elements ranging from analog to digital hardware, overhead projectors to document cameras, televisions to LCD projectors, desktop computers to tablets. Each newer technology program or application presents new challenges for education professionals: financing them, installing them, learning to use them, and teaching with them. Teachers are often not supported in their attempts to infuse technology into the curriculum (Koehler & Mishra, 2009; Zyad, 2016).

Since technologies change at a rapid pace, many teachers never learned to use these technologies during their teacher preparation training, or the training quickly becomes outdated (Brown, 2014; Cavenall, 2008; Zyad, 2016). Koehler and Mishra (2009) stated that given busy teacher schedules, it is difficult for teachers to learn how to use new technologies and programs. When professionals lack training in using a technology and they do not feel confident using it, it is unlikely that they will attempt to use that technology in a classroom setting. Teachers are often unprepared by teacher education programs and professional development training to

attempt to infuse technology into the curriculum (Koehler & Mishra, 2009). Specifically, Koehler and Mishra (2009) found that those offering professional development for technology do not consider the varied aspects and conditions of classroom situations and tend to assume that a standard implementation policy is shared by all.

Anderson (2009) reported that a study by the National Education Association (NEA) and the American Federation of Teachers (AFT) found that most teachers use technology for classroom management and for administrative purposes rather than for instruction. The increased demands of multiple legislations, rigorous standards, and additional content areas of instruction over the years cause a decrease in time available for teachers to teach with creativity, authenticity, and personalized methods (Anderson, 2009). In fact, Anderson postulated, "The combination of NCLB and other demands have created a situation where teachers have little time or interest in using technology beyond basic instructional management and easy-to-implement instructional tasks they are comfortable with" (Anderson, 2009, para. 1).

The purpose of education is to prepare students to be productive lifelong learners, ready for college and careers. The goal of schools is to create global citizens capable of competing and succeeding in a global society. Technology permeates Americans' daily lives, and it is incomprehensible to imagine life without electronic devices. It seems sometimes as if using technology is more important than living life in the moment (Boers, 2012, p. 19). Boers (2012) offered a perspective that is rarely seen in this global, technological society: Technology is not always a problem solver and is, in fact, a problem creator. Boers explained that his mentor, Albert Borgmann, believes that the technology invented to make our lives easier and give us more time has actually done the reverse. Teachers often find this to be true; as classrooms shift to being more technology centered than ever before, the need for teachers to be proficient and

capable in using and instructing with technology is higher than ever. The time spent learning to be proficient in the technology takes time away from classroom preparation and focus.

Without appropriate and effective professional development, education reform is not successful (Kee et al., 2012). Politics plays a tremendous role in education at present, with many leaders, legislators, and lobbyists making important education decisions at this crucial time of educational reform. College and career readiness is the content knowledge, habits, and skills high school graduates must possess from a rigorous, comprehensive, and well-rounded high school curriculum including, but not limited to, reading, writing communications, math, teamwork, critical thinking, and problem solving to be successful in all future endeavors, whether they be academic or career oriented (National High School Center, 2011).

It is important to share the planning and development of the educational process, including professional development, with the other stakeholders in education. Including the community, teachers, parents, and students in the decision-making process enables the school district to understand the direction the public wants to the school to take and the priorities they have (Kee et al., 2012). Student-centered school–community collaborations benefit and include all stakeholders in the educational process, because the people involved are communicating openly and clearly. This form of collaboration creates "dialogue about districtwide needs and goals that spanned grade levels, positions, and perspectives" (Sanders, 2005, p.71). It improves the relationships between the stakeholders in education, especially those between the administration and the school board and the community. Although student-centered school–community collaborations are challenging to implement, the benefits far outweigh the efforts.

Factors Affecting Education

Several factors influence education in the United States today. Due to a worldwide economic decline, the amount of money available for education has declined in recent years, whereas the expense of education continues to rise. Major socio-economic differences are changing education, not just globally, but within small communities as well. Students from affluent, educated environments tend to have parents who advocate for their children, have access to advanced technologies, promote learning, and encourage their children to succeed, but students from families who are from less economically sound environments may not get the parental support necessary to help them to succeed and achieve. As Darling-Hammond (2010) noted, "The parents of those who have had high-quality preschool for several years and enriched home environments often demand a more academically accelerated curriculum while students without these advantages still need to learn their colors, numbers, and other basic concepts" (p. 34). Darling-Hammond further pointed out that in areas with higher poverty concentration and clustered groups of racially and culturally similar groups, there may be fewer examples of successful academics and professionals to follow.

In 1965, President Lyndon B. Johnson enacted the Elementary and Secondary Education Act, Title 1, Part A of which provided financial assistance for lead educational agencies (LEAs) and schools, based on their population of low-income students, to help ensure that students meet the academic standards (United States Department of Education, 2014). Since then, there have been many changes to the landscape of New Jersey education throughout the years, especially in the funding system. After many lawsuits, countersuits, mandates, and changes to the state formulas for funding school districts, the parity system is no longer in place, having been replaced by a more need-based system (State of New Jersey, 2016b). Transforming education in

the United States to a more equitable process greatly increases the chance the number of successful students and successful schools will increase (Patrick, 2012; Roche, 2013; Roth, 2014). The schools in the United States are so very different in terms of quality, quantity, improvements, programs, and potential because there is neither consistent funding nor equal opportunities for these schools (Patrick, 2012).

Improving teacher preparation programs is a priority if we are to improve education in this country. College courses leading to teacher certification should be more rigorous to improve the quality of students studying to become teachers. We need to improve teacher status, respect, professional development, support, and pay scale to entice quality college students and retain great teachers (Patrick, 2012). The future of high quality education lies in the hands of highly motivated, properly trained, completely supported, and well-respected teachers (Patrick, 2012; Roth, 2014). A variety of factors are transforming the world and affecting education (Patrick, 2012; Stewart, 2012). The need for educational reform is apparent because the world is changing rapidly and we need to prepare our students to live and work successfully in a global society.

Review of Methodological Issues

While the review of methodological issues has the potential to inform practice, a review of the literature provided recognition that professional development for integrating technology into the everyday classroom needs to be effective, ongoing, and personalized. Minimal research has been conducted on teachers' perception of professional development that is effective for integrating technology into the classroom. The style of professional development that teachers believe is helpful often differs from the format that districts often engage, and few teachers believe it is satisfactory or improving (Boston Consulting Group, 2014). Previous research was

developed primarily through a qualitative method that considered only a small number of teachers in specific situations (Clausen, 2007; Kurt, 2013; Song & Looi, 2012). The need for a study to determine the perceptions of teachers regarding ways to enhance the effectiveness of professional development is clear.

This review of the literature provides a way to evaluate the recommendations and guidelines reflected in the analysis. Current research informed about professional development regarding use of technology with the data gathered from specific cases. This information was not applicable to all situations and did not relate to technology integration or to the variables addressed in this research study: years of educational experience, highest degree level earned, and self-assessed level of technology usage.

Information for this study was gathered from multiple school districts in northwestern New Jersey to determine the perceptions of teachers in this demographic area in hopes that they would be generalizable to other similar school districts. Prior research on similar topics includes qualitative studies with interviews and information very specific to particular situations (Clausen, 2007; Kurt, 2013; Song & Looi, 2012), while a broad-based approach assists a greater population (Boston Consulting Group, 2014). With the introduction of legislation in New Jersey regarding professional development in technology usage in the classroom (New Jersey Assembly, 2015), it is clear that the perceptions of teachers regarding the effectiveness of current professional development are needed to provide the ground work for this directive. Qualitative research methods include interviews, observations, case studies, surveys, and historical and document analyses. Qualitative research is unique to the situation and participants being studied, which may not allow the results to be generalized to other settings or people. The perspective of a

small number of people may not translate as useful to other situations, whereas a survey of a large sample of participants translates to a broader group.

Synthesis of Research Findings

The increased governmental requirements for the integration of technology into the classroom have created a need for research to determine the most appropriate and effective ways to improve the use of technology in the classroom (Achieve, 2013; ACT, 2008; United States Department of Education, 2010). New common standards for education, student achievement expectations, and standardized testing are national issues with a focus on standards-based accountability (Achieve, 2013; Dede, 2014). Ongoing, effective professional development is necessary to integrate technology and transform education (United States Department of Education, 2010).

However, there is a disparity in the format of professional development that districts focus on and the format the teachers believe is helpful (Boston Consulting Group, 2014). Researchers indicate that a lack of quality, effective professional development for teachers is a barrier to the successful integration of technology into the classroom (Broussard, 2009; Dede, 2014; Erişti et al., 2012; Kee et al., 2012; Thompson, 2015). Education programs must prepare students to become technologically literate, responsible, and respectful digital citizens in a global community (Achieve, 2013; ACT, 2008; Gorlewski, 2013).

An understanding of the use of technology offers both teachers and students opportunities to function effectively and helps students confront a wide range of real-world issues in an increasingly technological world (Achieve, 2013; ACT, 2008; Dede, 2014; Gorlewski, 2013; Kee et al., 2012). Schools use technology as a tool to help students access, interpret, organize, synthesize, and present information (Kee et al., 2012). Students must communicate effectively

with a variety of other people, appreciate other cultures and ways of living, and think clearly and deeply to be able to solve complex problems in a variety of subject areas. Students must be prepared to use many forms of technology accurately and resourcefully throughout their primary education, college, and career (Achieve, 2013; Gorlewski, 2013; National High School Center, 2011).

Previous research was developed primarily using a qualitative method and considering only a small number of teachers in specific situations (Clausen, 2007; Kurt, 2013; Song & Looi, 2012). Computer usage in schools has been identified as minimally improving writing scores and not overall student achievement based on level of technology integration (Campuzano et al., 2009; Goodwin, 2011). School districts vary greatly depending upon the region, demographics, and financial support of their area, making it more difficult to apply specialized case studies more difficult to a large number of schools. As English (2011) explains,

> Teachers, in partnership with school administrators, frequently examine the present school structure and the underlying assumptions about learning and schooling with the goal that the school community will actively construct the best program for their community in light of district, state, and federal requirements. (p. 344)

New Jersey has been ranked as the top overall school system in the country, and ranks second for education output and safety (Napoliello, 2014). At present, the state of New Jersey uses the Common Core Standards and the standardized assessments created by the PARCC (Achieve, 2013). The students' level of proficiency of computer skills and digital literacy is assessed directly in the State of New Jersey as they participate in the PARCC exam online (Clark, 2016; Herold, 2016).

With the rush to increase technology in school districts, there has been little focus on how to use technology to enhance student performance (Young & Bush, 2004). There is no clear direction for teachers regarding the use of technology in the language arts classrooms, leaving many to have computer usage by students as an afterthought, not within the curriculum (Young & Bush, 2004). School districts increase the quantity of technology without assisting teachers in understanding the ways that technology use within the classroom helps to reach the curricular goals and why they should use technology in this manner (Young & Bush, 2004). Research indicates that myriad barriers to the successful integration of technology into the classroom are myriad and include insufficient professional development, low teacher self-efficacy, technology limitations, and budgetary concerns (Martin et al., 2010; Penuel, 2006; Wolf et al., 2011). The goal of this study was to examine teachers' perceptions of professional development intended to facilitate the integration of technology.

Critique of Previous Research

Previous research indicates a need for a study that will identify teachers' perceptions of professional development regarding integrating technology into the classroom. Professional development is crucial to the successful implementation and integration of technology into the classroom (Martin et al., 2010). Yet previous research on this topic was developed primarily using a qualitative method and took into consideration only a small number of teachers in specific situations (Clausen, 2007; Kurt, 2013; Song & Looi, 2012).

The need for a study to determine the perceptions of teachers regarding ways to enhance the effectiveness of professional development is clear. Minimal quantitative research has been conducted on teachers' perceptions of professional development that is effective for integrating technology into the classroom. The examples given in most studies are from specific case

studies and apply to these particular cases rather than to the majority of school district teachers (Martin et al., 2010; Penuel, 2006; Wolf et al., 2011).

Teachers improve their practice through reflection, training, and professional development. Appropriate professional development is necessary for good teaching to occur (Cooper, 2014; United States Department of Education, 2017). Formats of professional developments that some studies found to be successful include providing job-embedded professional development and hiring digital literacy coaches. The professional development activities are most successful when they are offered within the teachers' home school organization in a way that is continuous, reflective, and supportive (Hennessy & London, 2013). Taking advantage of job-embedded professional development helps the teacher to improve the infusion of technology into the curriculum (Cooper, 2014; United States Department of Education, 2017). The educational role of a coach in a school setting is much like that of an athletic coach who is striving to take the performance to the next level (Neufeld & Roper, 2003). Coaches can assist teachers in integrating technology into the curriculum in an ongoing, sustained support program. With the implementation of a digital literacy coaching program, teachers would receive the technical support and personalized instruction necessary to improve their use of technology in the classroom.

New Jersey has been ranked as the top overall school system in the country and ranks second for education output and safety (Napoliello, 2014). The state has adopted the Common Core Standards and the standardized assessments created by the PARCC (Achieve, 2013). The rollout of nationwide trials of computer assisted standardized testing began in 2013, with nationwide implementation in 2014 (Achieve, 2013). The state of New Jersey has adopted the

Common Core Standards and the standardized assessment created by the PARCC (Achieve, 2013).

Three separate assessments are scheduled for many fourth-grade students in New Jersey: the new online PARCC exam (Achieve, 2013), the New Jersey Ask Science exam (State of New Jersey, 2014), and the NAEP. The students' proficiency with computer skills and digital literacy is now directly assessed by the State of New Jersey. To ensure that students receive the guidance and technology skills they need, teachers must be provided with the professional development in technology necessary to effectively integration of technology into the classroom (Wolf et al., 2011). New Jersey students need proficiency in basic computer skills and digital literacy to adequately display their language arts and mathematics knowledge on the PARCC computerized tests given online.

Summary

The New Jersey Technology Plan goals include infusing technology into the curriculum, and school districts are charged with maintaining the appropriate level of technology infrastructure to allow students to become proficient in digital literacy (State of New Jersey, 2014a). A bill was introduced into the New Jersey legislature on June 11, 2015, to establish a "task force to study issues and make recommendations related to use of educational technology in public school classrooms" (New Jersey Assembly, 2015, para. 1). The bill, enacted by the Senate and General Assembly of the State of New Jersey, declared, "Teachers need ongoing professional development to ensure that they are able to confidently and effectively integrate technology as an instructional tool in their classrooms" (para. 2). The Senate and General Assembly of the State of New Jersey recognize the importance of effective, appropriate professional development for infusing technology into the curriculum. This study researched

teachers' perceptions of professional development intended to facilitate the integration of technology into the classroom and curriculum.

There is a common practice in this country of school districts purchasing packaged curriculum, curriculum teaching products, professional development programs, policy and procedure books, and other important school district materials. K–8 school district curriculum and professional development should be directly related to the individual school district's needs, its community, and its students (Bismack, Arias, Davis, & Palincsar, 2015; English, 2011; Shawer, 2017). Involving educators in the purchasing and training processes ensures that the materials are suitable and meaningful for the school district's personnel and their students (Bismack et al., 2015; English, 2011; Shawer, 2017). As English (2011) explains, teachers often assist school administrators in decision making and consider the demographic, climate, and needs of their school district before selecting educational programs and strategies.

Digital literacy skills are now a tested subject area with the onset of the PARCCC exam (Achieve, 2013), and schools need to prepare their students. School district personnel have to develop challenging curriculum; use inquiry-based, hands-on learning instructional methods enriched with technology; and ensure that students and teachers are proficient users of these new technologies as they are introduced. Educators use technology to encourage students to develop higher-order thinking skills and to function effectively in this global society (Gahala, 2001). Technology can improve communication, enhance thinking skills, make instruction more efficient and effective, and develop life skills critical to success. The national and state plans call for school districts with technological readiness and proficiency for every teacher and student, along with college and career readiness for students in all subject areas. Schools should offer

ongoing, effective professional development for teachers to assist them in using technology in an engaging, productive, innovative way.

In this chapter, the researcher presented a review of the literature related to professional development for educators, integration of technology into the classroom, and the developments in legislation regarding standards based education and evaluation. The research included information specific to New Jersey technology standards implementation which helped to guide this study. In the next chapter, the researcher discusses methodology and procedures for the study.

Chapter 3: Methodology

This study was based on the technology proficiency requirements for students and teachers to meet the standards set by the United States Department of Education (2010a). The Blueprint for Learning (United States Department of Education, 2010a) calls for professional development for teachers that helps teachers improve student learning using resources and materials that are aligned with the college and career readiness standards. The National Education Technology Plan (United States Department of Education, 2017; United States Department of Education, 2010) calls for improved, effective, ongoing professional development for teachers in efforts to completely integrate the technology plan and transform education. Given the aim of having teachers become more proficient and better able to integrate technology in the curriculum, extended, effective professional development in digital technology is needed.

Teachers stated that professional development selected by school district administrators is often contrary to the format teachers find helpful (Boston Consulting Group, 2014). Professional development is identified as satisfactory and improving by only a small percentage of teachers (Boston Consulting Group, 2014). Little research has been conducted on teachers' perceptions of professional development that is effective for facilitating the integration of technology into the classroom (Boston Consulting Group, 2014; Wolf et al., 2011). If schools are to improve the integration of technology into everyday classrooms, teachers need more sustained, effective professional development in technology and related programs (Broussard, 2009; Kee et al., 2012; United States Department of Education, 2010).

Many research studies on the integration of technology into the classroom are specific to particular school districts, so the need for a quantitative study that identifies the broader needs of many school districts is apparent, because this approach offers a collection of data from multiple

participants at one point in time. The strengths of traditional quantitative research are its emphasis on explanation, prediction, standardized data collection, and statistical analysis (Johnson & Onwuegbuzie, 2004, p. 18). The survey method employed in this study was used to gather the information necessary to address the research questions and the relationships between variables (Pallant, 2010). Using quantitative research also eliminates the potential for personal bias often found in qualitative or mixed-methods research (Johnson & Onwuegbuzie, 2004).

Both the United States Department of Education (2010) and Mouza (2008) recommend that additional quantitative studies be conducted in the field of technological integration across the grade levels. Mouza (2008) advises that using a quantitative research method that includes large populations of both teachers and students is more beneficial for the purpose of determining attitudes toward technology that are representative of the public. Rather than focusing on one school district for a case study, Mouza suggested that researchers use quantitative methods to collect data regarding student attitudes and assess student achievement in the context of the use of technology in the classroom.

In this study, the researcher gathered quantitative data via a survey that assessed teacher perceptions. This study is presented to determine teachers' perceptions of the effectiveness of professional development addressing technology use in the classroom. This study investigated teachers' perceptions of the effectiveness of professional development activities related to the successful integration of technology into the classroom. This study investigated whether teachers' perceptions of the effectiveness of professional development changed depending upon their years of experience, highest degree level earned, or self-proclaimed level of technology usage.

Purpose of the Study

The purpose of this study was to investigate the perceptions of a sample of northwestern New Jersey schoolteachers regarding the effectiveness of current professional development addressing the successful integration of technology into the classroom. This study examines the perceptions of teachers regarding the current technology usage level serving to evaluate the current level of teacher perceptions concerning professional development training in technology. This study could serve as the basis for planned improvements for technology education in the state of New Jersey. School district administrators make decisions regarding how to prudently spend professional development budget dollars on effective, ongoing professional development for teachers' professional development. Offering a consensus regarding the technology professional development training methods perceived as most advantageous by educators will be beneficial for school districts that are in the midst of this decision-making process.

The information gathered in this study may assist school district administrators as they make decisions related to the type of professional development necessary for teachers in their school district to use technology effectively in New Jersey public school classrooms. Researchers indicate that a lack of quality, effective professional development for teachers is a barrier to the successful integration of technology into the classroom (Erişti et al., 2012; Thompson, 2015). School districts need to be aware of the effective forms of professional development for integrating technology into the classroom so that they may incorporate them into their own professional development programs. Armed with this information, school district administration and professional development committees will be better able to select effective professional development that will meet the needs of their staff.

A review of the literature provided recognition that professional development for integrating technology into the everyday classroom needs to be effective, ongoing, and personalized. The need for a study to determine the perceptions of teachers regarding the effectiveness of professional development to improve integration of technology into the classroom is clear.

Research Questions and Hypotheses

The research question studied was: To what extent, if any, do teachers perceive professional development related to the successful integration of technology into the classroom as effective? Evaluated was the need for improved professional development in technological literacy to facilitate the integration of technology into classrooms. The following research questions evaluated professional development in the form of technology integration.

1. To what extent, if any, is there a statistically significant difference among teachers grouped according to years of experience and the teachers' perceptions of the effectiveness of professional development as related to the successful integration of technology into the classroom?

   $H1_0$: There is no statistically significant difference among teachers grouped according to years of educational experience and the teachers' perceptions of the effectiveness of professional development as related to the successful integration of technology into the classroom.

   $H1_1$: There is a statistically significant difference among teachers grouped according to teachers' years of educational experience and the teachers' perceptions of the effectiveness of professional development as related to the successful integration of technology into the classroom.

2. To what extent, if any, is there a statistically significant difference among teachers grouped according to the teachers' highest degree level earned and the teachers' perceptions of the effectiveness of professional development as related to the successful integration of technology into the classroom?

   $H2_0$: There is no statistically significant difference among teachers grouped according to teachers' highest degree level earned and the teachers' perceptions of the effectiveness of professional development as related to the successful integration of technology into the classroom.

   $H2_1$: There is a statistically significant difference among teachers grouped according to teachers' highest degree level earned and the teachers' perceptions of the effectiveness of professional development as related to the successful integration of technology into the classroom.

3. To what extent, if any, is there a statistically significant relationship between the teachers' self-assessed technology usage and the teachers' perceptions of the effectiveness of professional development as related to the successful integration of technology into the classroom?

   $H3_0$: There is no statistically significant relationship between teachers' self-assessed technology usage and the teachers' perceptions of the effectiveness of professional development as related to the successful integration of technology into the classroom.

   $H3_1$: There is a statistically significant relationship between teachers' self-assessed technology usage and the teachers' perceptions of the effectiveness of

professional development as related to the successful integration of technology into the classroom.

This researcher sought to determine to what extent, if any, teachers perceive professional development related to the successful integration of technology into the classroom as effective, and the extent to which there a statistically significant difference between these perceptions of teachers and the teachers' years of educational experience, highest degree level earned, and self-assessed level of technology usage.

Research Design

The design of this research was a survey design study that involved collecting data to answer the research questions (Creswell, 2014). Using a survey design provides a quantitative method of collecting information about the perceptions of a representative group of the population (Creswell, 2014). If survey participants accurately represent the general population investigated then the results should also accurately describe the characteristics of the general population as well (Fowler, 2014). A survey design study is an efficient method of collecting information from a wide range of the population quickly and cost-effectively. A survey was used to collect data regarding the perceptions of educators regarding professional development that was effective for integrating technology into the classroom. Differences between pairs of quantifiable variables were evaluated using descriptive analysis. Analysis of variance was calculated and statistical significance was determined between teachers' perceptions of different formats of professional development in technology and teachers' (a) years of teaching experience, (b) highest degree level earned, and (c) self-assessed level of technology usage.

The research design of this study was quantitative and used a survey research approach. Using a survey research instrument rather than personal interviews allows the researcher to

gather data in a more general pathway that school districts may be able to follow. During an interview, respondents may give reasons for their answers that are too personal, based on experience, choice, efficacy, preferences, and confidence, and that do not apply to the average educator. The strength of traditional quantitative research is its emphasis on deduction, confirmation, theory/hypothesis testing, explanation, prediction, standardized data collection, and statistical analysis (Johnson & Onwuegbuzie, 2004, p. 18). Data were collected and analyzed and a report of findings was prepared.

Quantitative research offers the opportunity to conduct data collection and analysis without the personal bias often present in qualitative or mixed method research (Johnson & Onwuegbuzie, 2004). This researcher used the survey methodology to collect information from a diverse group of subjects over a relatively large geographical area. This methodology allowed the researcher to obtain responses anonymously, ensuring confidentiality for respondents and the opportunity for subjects to respond in a forthright manner.

Using the interview process for data collection involves engaging a smaller sample; results may be too specific to the subjects interviewed, making the results skew to that population demographic. School districts may negate the results based on the demographics of the population sample, such as years of experience in education, degree levels of teachers, or technological ability of teachers, and so forth.

Information for this study was collected through surveys that gathered data about the perceptions of teachers and about the effectiveness of professional development related to the successful integration of technology into the classroom. Analysis of this data included identifying the perceptions of teachers regarding the effectiveness of professional development intended to facilitate the integration of technology into the classroom and how that selection

changed according to by years of experience, highest degree level earned, or self-proclaimed level of experience with technology. This study was expected to assist school districts in the selection of effective professional development that will enhance the integration of technology into the classroom.

The analysis identified other factors, such as teachers' years of experience, highest degree level earned, and self-proclaimed level of experience with technology, related to the identification of professional development needs for technology. The survey identified differences between these variables and the perceptions of teachers concerning professional development needs. The study can be used to assist professional development committees and administrators in selecting the most appropriate format of professional development based on the general makeup of the teaching population.

Categorical and quantifiable data gathered in this study include educators' years of teaching experience, highest degree level earned, and level of technology usage. Teachers' perceptions of the effectiveness of professional development and their use of technology were quantified using participants' responses to a Likert-scale survey. The quantitative design of this study consisted of surveys released to school districts within the northwest portion of the state of New Jersey within the Demographic Factor Groups D–I. The surveys included demographic identifying questions, a Likert-scale survey of teachers' perceptions of forms of professional development, and a personal identification section.

The design for the study was based on the rationale that quantitative research offers hypothesis testing, explanation, and statistical analysis (Johnson & Onwuegbuzie, 2004). The data collected through the survey offered an opportunity for the analysis of the current perceptions of the teachers surveyed regarding professional development to improve technology

integration. In designing this study, consideration was taken as to how those perceptions might be affected by factors such as years of experience, self-proclaimed level of experience with technology, and highest degree level earned. The reliability and validity of the survey instruments, The Locator Self-assessment for Teachers survey (EdTech Locator for Technology Implementation, 2009) and The Quick Teacher Technology Usage Survey (PowerUp What Works, n.d.), were considered before the two surveys were selected. The surveys used in this research were developed with extensive research financed with federal grant funds from the United States Department of Education.

The Locator Self-assessment for Teachers survey (EdTech Locator for Technology Implementation, 2009) and The Quick Teacher Technology Usage Survey (PowerUp What Works, n.d.) are part of a large volume of resources located online at PowerUp What Works, a federally funded website designed to meet the needs of school districts in addressing Common Core State Standards as they relate to technology (PowerUp What Works, 2015). These survey instruments are used in many school districts across the country to reliably survey staff members with the intent of making recommendations for the integration of technology into those school districts, according to the Center on Technology and Disability (CTD, 2015).

The reliability of this research survey instrument was calculated using Cronbach's alpha, a test that measures the internal consistency. The survey questions that made up the proficiency score used to identify teachers' perceptions of the effectiveness of professional development as related to the integration of technology into the classroom were found to be highly reliable (5 items; $\alpha = .818$). Construct validity determines whether the survey instrument measures what it is intended to measure, giving meaningful information (Miller, Linn, & Gronlund, 2013). Both the Locator Self-assessment for Teachers survey (EdTech Locator for Technology

Implementation, 2009) and The Quick Teacher Technology Usage Survey (PowerUp What Works, n.d.) were created using currently accepted practices for technology in education, and formulation of the constructs was based on the national technology standards and included input from the Center for Technology Implementation (CTI), Office of Special Education Programs (OSEP), American Institutes for Research (AIR), the Education Development Center, Inc. (EDC), the Center for Applied Special Technology (CAST), and the United States Department of Education (CTD, 2015).

The data gathered addressed the following perceptions regarding professional development in the context of integration of technology into the classroom. Analysis of the data provided understanding of the perceptions of teachers regarding professional development as it related to the integration of technology into the classroom, to respondent's years of teaching experience, to highest degree level earned, and to self-assessed level of experience with technology.

Target Population, Sampling Method, and Related Procedures

The participants in this study were selected through convenience sampling of pre-K–8th-grade teachers in school districts located in northwestern New Jersey, as the primary selection criteria was geographic location (Lavrakas, 2008). Convenience sampling is different from purposive sampling in that the participants are chosen due to proximity rather than judgment to select a representative sample (Lavrakas, 2008). All teachers in this geographic group were invited to complete the survey via e-mails sent to the individual school district administrators. In 2014, there were 113,818 full-time teachers in the state of New Jersey (State of New Jersey, 2015). Since the geographic areas of New Jersey are vastly different, this researcher focused

specifically on the northwest portion of the state, which has District Factor Group ratings similar to those of my elementary school.

Of the 1,879 certified teachers currently employed in northwest New Jersey invited to participate in the survey, about one-hundred twenty-eight were expected by this researcher to respond. Using an a-priori sample size calculator for *t* tests (Soper, 2016), it was determined that to achieve the anticipated effect size of 0.5 with a desired statistical power level of 0.8 and a probability level of 0.05, the minimum sample size for a two-tailed hypothesis was 128 participants, with the actual response of 118 surveys with 97 marked as finished by Qualtrics Software.

New Jersey's elementary schools are diverse and face different challenges. Some schools are fully funded, staffed, and supplied; others are underfunded, lack appropriate staff, and have minimal supplies. Some school districts have additional security issues, teacher retention problems, and difficulty making adequate yearly progress. Selecting districts in the mid-range of the demographics, similar to the demographics of this researcher's local school districts, helps to represent the needs of these schools. The survey was available online through Qualtrics and required approximately 10 minutes to complete.

The participants were informed that their participation in the study was voluntary and required only a one-time interaction. The survey responses were selected using a mouse click. This researcher informed the participants that responses to survey questions would be kept completely confidential and that the results of the survey would be available to them upon request. The Locator Self-assessment for Teachers survey (EdTech Locator for Technology Implementation, 2009) was employed to assist teachers in identifying their own level of technology usage for informational purposes.

Respondents were sent an invitation to a protected web-based survey. The survey consisted of four sections with up to 15 statements to be evaluated on a Likert scale based on the section topic. After completing of the survey, respondents were offered the opportunity to enter a drawing for a gift card by e-mailing a code to the research e-mail address, an approach that kept responses anonymous. Five gift certificates valued at $20 each were subsequently e-mailed to random respondents at the conclusion of the data collection period.

Instrumentation

The survey instrument for this study was an online survey module that was distributed to school districts in northwestern New Jersey. The survey was created from two separate preexisting surveys, The Locator Self-assessment for Teachers survey (EdTech Locator for Technology Implementation, 2009) and The Quick Teacher Technology Usage Survey (PowerUp What Works, n.d.), with demographic questions added. The Locator Self-assessment for Teachers survey is a five-question, multiple choice survey to help the teacher evaluate his or her own personal technology level (EdTech Locator for Technology Implementation, 2009). The Quick Teacher Technology Usage Survey (PowerUp What Works, n.d.) was used to collect information regarding teachers' perceptions of technology usage in schools and accompanying data. The Quick Teacher Technology Usage Survey (PowerUp What Works, n.d.) is a survey used to determine teachers' perceptions of professional development. The reliability and the validity of the survey instrument were considered before the surveys were selected. The two surveys selected for use in this study were developed with extensive research conducted with federal grant funds from the United States Department of Education. The Locator Self-assessment for Teachers survey (EdTech Locator for Technology Implementation, 2009) and The Quick Teacher Technology Usage Survey (PowerUp What Works, n.d.) are part of a large

volume of resources located online at PowerUp What Works, a federally funded website designed to meet the needs of school districts in addressing Common Core State Standards as related to technology (PowerUp What Works, n.d.).

Documentation on the implementation material states:

> PowerUp What Works is a product of the Center for Technology Implementation (CTI), which is funded by the U.S. Department of Education, Office of Special Education Programs (OSEP), under award #H327G09004. CTI is operated by American Institutes for Research (AIR) in collaboration with the Education Development Center, Inc. (EDC) and the Center for Applied Special Technology (CAST). (CTD, 2015)

These survey instruments are used in many school districts across the country to reliably and validly survey staff members to allow administrators to make recommendations for the integration of technology into those school districts (CTD, 2015).

The reliability of this research survey instrument was calculated using Cronbach's alpha, a test that measures internal consistency. The survey questions that made up the proficiency score used to identify teachers' perceptions of the effectiveness of professional development as related to the integration of technology into the classroom were found to be highly reliable (5 items; $\alpha = .818$). Construct validity determines whether the survey instrument measures what it is intended to measure, giving meaningful information (Miller, Linn, & Gronlund, 2013). Both the Locator Self-assessment for Teachers survey (EdTech Locator for Technology Implementation, 2009) and The Quick Teacher Technology Usage Survey (PowerUp What Works, n.d.) were created using currently accepted practices for technology in education and using the national technology standards to formulate the constructs. These standards and practices included input from the Center for Technology Implementation (CTI), Office of

Special Education Programs (OSEP), American Institutes for Research (AIR), Education Development Center, Inc. (EDC), Center for Applied Special Technology (CAST), and U.S. Department of Education (CTD, 2015). Respondents were selected from a geographical sampling of preschool through eighth-grade teachers to be generally proportional to the demographic strata of northwestern New Jersey teachers.

The demographic questions included school district information, such as geographic location of the school district and school district Demographic Factor Group as determined by the state of New Jersey. The questions regarding the teachers themselves included questions about years of teaching experience and highest degree level earned.

For both surveys used, the Locator Self-assessment for Teachers survey (EdTech Locator for Technology Implementation, 2009) and The Quick Teacher Technology Usage Survey (PowerUp What Works, n.d.), the formulation of the constructs was based on the national technology standards and currently accepted practices for technology in education. These standards and practices included input from the Center for Technology Implementation (CTI), Office of Special Education Programs (OSEP), American Institutes for Research (AIR), the Education Development Center, Inc. (EDC), the Center for Applied Special Technology (CAST), and the U.S. Department of Education (CTD, 2015), lending to the validity of the survey instruments. These survey instruments are used in many school districts across the country to reliably and validly survey staff members to allow administrators to make recommendations for the integration of technology into those school districts (CTD, 2015). The reliability of this research survey instrument was calculated using Cronbach's alpha, a test that measures internal consistency. The survey questions that made up the proficiency score used to

identify teachers' perceptions of the effectiveness of professional development as related to the integration of technology into the classroom were found to be highly reliable (5 items; $\alpha = .818$).

Since the geographic areas of New Jersey are vastly different, this researcher focused specifically on the northwest portion of the state. The study's participants were adult, certified teachers working in the selected school districts. There was no anticipated risk to participants in this research study, and its participants were not considered a vulnerable population.

Following ethical procedures and standards is important, as is discussed by Creswell (2014) and the Institutional Review Board (IRB) permission procedures, and this researcher applied to Concordia University's Institutional Review Board (IRB) to request permission to conduct the research study and received said permission. Individual participant consent was included in the online module and was granted by participants before they began the online survey. If potential participants declined to give consent, the survey ended immediately.

The order of events for this study included the creation of an online survey that merged two pre-existing, validated surveys. This researcher obtained permission from the IRB of the University, the school district administrators, by forwarding the e-mail requests to their staff, and the respondents by affirming their response on the survey. The administration of the online survey continued with technical assistance provided as needed, additional e-mail requests forwarded, and responses to e-mailed questions regarding the study sent.

Data Collection

This study was a quantitative study based on data collected through a survey. The quantity of completed surveys received depended upon the response rate. In total, Qualtrics recorded 118 survey responses, with 97 surveys marked as finished, eight test surveys, and the 21 remaining surveys at varying levels of completion. For the purposes of this study, only the

surveys marked as finished were considered. Focusing on the suburban rural school districts of the northwest section of New Jersey made the most sense for this study. This survey provided information through the responses of the participants, and the data were analyzed. This methodology was used to provide an opportunity to collect information from a diverse group of subjects over a relatively large geographical area while ensuring confidentiality for the respondents.

This study focused on teachers' perceptions of the effectiveness of professional development intended to help in integrating technology into the everyday classroom. The state of New Jersey maintains a public database of all school district administrators. This researcher used this database to contact the administrators and to ask them to pass the survey questionnaires on to their staff. Although using e-mail addresses and online surveys excluded some people who did not use computers efficiently, it was expected that most school employees would be able to navigate through the e-mail survey questionnaire.

The source of error for delivery seemed to be minimal based on the state requirement that all school districts in New Jersey are required to use e-mail. The potential for administrators to elect not to forward the survey, the potential for staff to be swayed by the administrator forwarding the survey, and failure to complete the survey were sources of error. Another source of error included the mood, attitude, and current state of emotions of the participants as they responded to the survey, because such elements can affect responses. Possible sources of error included false responses given if the participant believed his or her school district might have an opportunity to view the responses given. Other sources of error included misunderstanding the questions or the response options, a lack of experience with various methods of professional development, and attitude toward technology.

Operationalization of Variables

Several variables are discussed in this study. For the purposes of this study, *administrators* shall refer to any school district employee with an administrative certificate working in a supervisory capacity for more than 50% of the school week. A *teacher* shall refer to any certificated educator working with students in a classroom setting for more than 50% of the school week. For the purposes of this study, teaching experience was measured in a range of whole years. *Professional development* refers to teacher training programs of any format offered by the school district with the intention of providing learning experiences for staff. *Self-determined level of technological experience* refers to the individual's determination of his or her own ability to use technology.

Highest degree level earned included options for specific degrees and certifications. *Teaching assignment* referred to the job or position that the educator held within the school— for example, third-grade teacher or World Language teacher. Results of the rankings on the Likert scale established levels of effectiveness, enhancement, and other determinations of the professional development. For the purposes of this study, the operational definitions of the variable of the *effectiveness of professional development* related to the successful integration of technology into the classroom was determined by the total raw score of the results of question number five, labeled Areas of Improvement/Technical Needs. The total scores were added together to form one raw score to use as the measure of effectiveness of the professional development for each respondent. For the purposes of this study, the options on the Likert scales were given a numeric ranking and word descriptors with specific descriptions, such as *urgent*, *slightly more urgent*, and *more urgent*. The numeric results were used for the statistical calculations.

Data Analysis Procedures

The researcher analyzed the data using a spreadsheet, the online web-based survey program Qualtrics, and the IBM Statistical Package for Social Sciences (SPSS) data analysis software SPSS Statistics 24. This researcher collected the statistics through an online survey located on Qualtrics and the results were stored securely within the web-based survey program. This researcher used the online survey to collect data about the perceptions of educators regarding professional development offered in attempts to integrate technology into the classroom. This researcher considered the differences between pairs of quantifiable variables through descriptive analysis. Correlational analyses were used to examine the relationship between the teachers' perceptions of effectiveness of professional development as related to technology integration in the classroom and their self-assessed technology usage score. This researcher calculated statistical significance to quantify teachers' perceptions of the effectiveness of professional development in technology in relation to their (a) years of educational experience, (b) highest degree level earned, and (c) self-assessed level of technology usage.

The initial data analysis involved checking the surveys for completion, after which the data collected through the survey were compiled using totals, cross-tabulations, and percentages via the web-based survey instrument Qualtrics. For the purposes of this study, the perceptions of teachers regarding the effectiveness of professional development related to the integration of technology into the classroom were calculated using the average of the score proficiency from the completed questions in Section 1: General Technology Use in Education of the Quick Teacher Technology Usage Survey (PowerUp What Works, n.d.). These questions relate to the technology perceptions of the teachers gauging their skill and the importance they place on each of the technology related tasks. The higher the raw score, the more likely the teacher's

perception is positive. The total score was calculated from the mean of the scores assigned to each of the questions answered for proficiency in Section 1: General Technology Proficiency and Importance of the survey.

Raw data files were uploaded to IBM SPSS Statistics 24 so that multiple statistical analyses could be run. This researcher calculated one-way tables to obtain a simple original analysis of the number of responses for each survey question. Analyses included analysis of variance that calculated survey results. Differences between the groups were determined using an analysis of variance for significant difference. The statistical significance of these differences was reported, with alpha set at $p < .05$. Additional analyses included Pearson correlations calculated to indicate the degree of the relationship between selected pairs of quantifiable variables and categorical variables. The statistical significance of these differences was reported, with alpha set at $p < .05$. After running the statistical analyses, this researcher saved and stored the data and the results on multiple external password-protected hard drives for safety and security.

Limitations and Delimitations of the Research Design

Internal and External Validity. The limitations of survey research included possible difficulty with reaching participants, depending upon their location, availability, and reliability. Respondents may not have felt compelled to answer truthfully, depending upon such factors such as why they thought the survey was being conducted, whether they believed their school district might see the results, or other factors. Inherent errors in the survey itself, including problems with wording, answer selection, and length of time required to complete the survey are also limitations of the survey format. A viable survey instrument must be well designed if it is to provide researchers with the data they need and reduce the potential for errors. All survey

instruments have limitations (Fowler, 2014). All aspects of survey design must be considered to improve the likelihood that the results accurately and realistically represent the views of the populace.

Investigated was whether teachers found the methods of professional development provided to facilitate the integration of technology into the classroom effective. Data relating to perceptions of technological professional development, respondents' years of experience, self-identified level of technological proficiency, and highest degree level earned were collected. This researcher compiled the survey to obtain the needed data. This survey used items adapted from previously used and established surveys.

Sending surveys to educators in school districts that were similar to my home school district was beneficial for my purposes of improving the integration of technology into the classroom. Targeting school districts in the middle of the demographic factors groups rather than the higher or lower income areas will assist the school districts that generally have more funding concerns in New Jersey. The study did not investigate every format of professional development for technology, as the expense and time required to complete a longer survey would be prohibitive. This study also did not identify particular training methods from specific vendors.

The expectation was that the sample would be representative of the way in which the target population—teachers in general—would respond to the survey (Fowler, 2014). The participant responses were also expected to represent the characteristics of the population (p. 8). If survey participants accurately represented the general population investigated, then the results should accurately describe the characteristics of the general population as well (p. 8). Reducing

the differences between the sample and the general population reduces the potential for errors in generalizations based on the survey results (p. 9).

The results of this research project are highly transferable given that the survey instruments, The Locator Self-assessment for Teachers survey (EdTech Locator for Technology Implementation, 2009) and The Quick Teacher Technology Usage Survey (PowerUp What Works, n.d.), are useful in multiple situations for establishing greater effectiveness for technology within government entities, such as school districts. The steps that this researcher followed are clearly defined, making transferability completely possible. The two surveys selected for use in this study were developed based on extensive research done by multiple agencies and funded with federal grant money from the U.S. Department of Education. The reliability and the validity of the survey instruments were considered before the surveys used were selected.

The Locator Self-assessment for Teachers survey (EdTech Locator for Technology Implementation, 2009) and The Quick Teacher Technology Usage Survey (PowerUp What Works, n.d.) are part of a large volume of resources located online on federally funded websites designed to meet the needs of school districts in addressing Common Core State Standards as related to technology (PowerUp What Works, n.d.). These survey instruments are used in many school districts across the country to reliably and validly survey staff members in order to make recommendations for and improvements in the integration of technology into those school districts (CTD, 2015).

The reliability of this research survey instrument was calculated using Cronbach's alpha, a test that measures internal consistency (Sullivan, 2011). The survey questions that made up the proficiency score used to identify teachers' perceptions of the effectiveness of professional

development as related to the integration of technology into the classroom were found to be highly reliable (5 items; $\alpha = .818$). Construct validity determines whether the survey instrument measures what it is intended to measure, giving meaningful information (Miller, Linn, & Gronlund, 2013; Sullivan, 2011). Both the Locator Self-assessment for Teachers survey (EdTech Locator for Technology Implementation, 2009) and The Quick Teacher Technology Usage Survey (PowerUp What Works, n.d.) were created using currently accepted practices for technology in education, and formulation of the constructs was based on the national technology standards. These standards and practices included input from the Center for Technology Implementation (CTI), Office of Special Education Programs (OSEP), American Institutes for Research (AIR), the Education Development Center, Inc. (EDC), the Center for Applied Special Technology (CAST), and the U.S. Department of Education (CTD, 2015), lending to the validity of the survey instruments.

Expected findings. The findings expected were that the majority of teachers would perceive that professional development addressing the integration of technology into the classroom are ineffective. Ongoing, effective professional development in technology-related programs for teachers is necessary to improve the integration of technology into everyday classroom teaching. Prior research indicates that current professional development for technology is not good enough to improve integration (Boston Consulting Group, 2014; Broussard, 2009; Dede, 2014; Dindar, Kurt, & Eristi, 2012; Fullerton, 2013; Kee, Kupczynski, & Mundy, 2012; Keppler, Weiler, & Maas, 2014; NCES, 2010; Roth, 2014; Thompson, 2015; Unger & Tracey, 2013). Previous studies have shown that the lack of quality effective professional development is a barrier to successfully integrating technology into the classroom

(Boston Consulting Group, 2014; Dindar, Kurt, & Erişti, 2012; Thompson, 2015).

Teachers' perceptions of the effectiveness of professional development related to the successful integration of technology into the classroom vary with the format of the professional development. Using ongoing measures such hiring as technological literacy coaches improves the effectiveness of a school's professional development (Cooper, 2014; Grashel, 2014). Professional development activities are most successful when they are offered within the teachers' home school organization as continuous, reflective, and supportive (Boston Consulting Group, 2014; Cooper, 2014; Hennessy & London, 2013). However, teachers and administrators do not share similar thoughts on professional development, including format, length, and quantity (Boston Consulting Group, 2014). The study shows that the number of years of experience, highest degree level earned, or self-proclaimed level of experience with technology of the participant, may affect whether a format of professional development is perceived as effective in enhancing the integration of technology into the classroom.

Ethical issues. Bias always plays into survey results, but there are ways to reduce this form of error. The sample frame needs to include people from each possible group within the target population or the potential for bias will be present (Fowler, 2014, p. 10). The process of selecting who is included in the sample must be random or the results will be biased (p. 10). Of course, collecting a sample of people without any diversity at all reduces the variability in such a way that it creates a bias due to a lack of inclusion (p. 11).

Multiple errors are associated with the actual participant responses on surveys. The respondents' responses may vary depending on when, where, and how they complete the survey. Also, their attitude about their current teaching assignment in the moment they are responding may affect the results and increase the potential for error. It is important to reduce significantly

the potential for errors in the survey instrument, the population sample, and the participant responses.

An additional source of error may be that technologically proficient people will be more inclined to complete an online survey, perhaps reducing the sample of educational professionals who feel inadequate when using technology and thereby skewing the results. If education professionals feel confident in the use of technology, they may feel that additional technology-related professional development for the school district will reduce the funds available for other needs. Due to the timing of the survey, administrators and educators may not be in the school district during the month of August, when the survey was distributed.

Teachers sometimes do not retrieve their school e-mail messages during the summer months, reducing the likelihood of their participating in the survey. The general duties and responsibilities of the teachers, who are returning to school in September, may make teachers less inclined to participate in an online survey. Alternatively, technologically literate educators may be more likely to desire additional professional development in technology for their coworkers to encourage the use of technology in the school district.

Summary

This chapter summarized the methodology of the study to present the information necessary to validate the research. Teachers from northwest New Jersey were surveyed about their perceptions of the effectiveness of professional development as it relates to the integration of technology into the classroom. This study was completed to gauge the perceptions of New Jersey teachers regarding the effectiveness of professional development for integrating technology in the classroom and whether it would be different based on the makeup of the staff. Teachers' perceptions were compared in a variety of subgroups based on the teachers' years of

teaching experience, highest degree level earned, and self-assessed technology levels. This researcher analyzed the data using analysis of variance, which measures the differences between two variables in interval scales. Studying frequencies can assist a researcher in identifying differences between variables. In the next chapter, the results of the study are discussed and information regarding the findings are presented. The results of this study are intended to provide school districts with information regarding educators' technology professional development format preferences. Based on this information, school districts may be better equipped to meet the professional development needs of their teachers charged with integrating technology into the classroom.

Chapter 4: Data Analysis and Results

The main goal of this study was to determine teachers' perceptions of the effectiveness of professional development that addresses technology use in the classroom and the successful integration of technology into the classroom. This goal drove the data collection and analysis as the researcher attempted to develop knowledge about professional development for technology use in the classroom as it is perceived by the teachers and to determine whether there are differences in the ways in which the professional development is perceived based on the number of years of teaching experience or self-proclaimed level of experience with technology.

This study was completed and might provide a baseline in New Jersey for perceptions of teachers regarding the effectiveness of professional development as related to the integration of technology in the classroom and whether it would be different based on the demographic makeup of the staff. The results of the data analysis are presented in this chapter. The data were collected and then analyzed in response to the research questions posed in Chapter 1 of this dissertation. The findings presented in this chapter demonstrate the need for an improvement in the form of extended, effective assistance and training for teachers in the context of using technology.

Prior research indicates that although 95% of teachers indicate they have some level of training in technology use in the classroom, 48% desire to learn more about integrating technology into the classroom (Bolkan, 2015). Teachers need extended, effective professional development in technology to improve their ability to integrate technology into the curriculum (Boston Consulting Group, 2014; Broussard, 2009; Kee et al., 2012). Many teachers feel unprepared to use technology effectively in the classroom (Boston Consulting Group, 2014; Broussard, 2009; Latio, 2009). Teachers and administrators often do not share the same ideas

about professional development, including format, length, and quantity (Boston Consulting Group, 2014). If teachers are to become proficient and improve their ability to integrate technology into the curriculum, they must be provided with extended, effective professional development in digital technology.

The data collected in the study include information about teachers' perceptions of the effectiveness of professional development to increase the use of technology. Research is lacking that combines the factors of years of teaching experience, highest degree level earned, and self-proclaimed levels of experience with technology and the effect those variables have on teachers' perceptions of the effectiveness of professional development intended to facilitate the integration of technology into classrooms. There is no current research available gauging the level of teachers' perceptions of the effectiveness of professional development in New Jersey prior to the introduction of the legislation to improve professional development as related to the integration of technology into the classroom. The results of this study could possibly be used to assists administrators in supporting the teaching population with professional development for the improved use of technology in efforts to enhance learning in the classroom. The results of this study may provide useful information for school leaders regarding these factors and their relationship to the integration of technology into the classroom.

Research Questions

The research question studied was: To what extent, if any, do teachers perceive professional development related to the successful integration of technology into the classroom as effective? Evaluated was the need for improved professional development in technological literacy to facilitate the integration of technology into classrooms. The following research questions evaluated professional development in the form of technology integration.

1. To what extent, if any, is there a statistically significant difference among teachers grouped according to years of experience and the teachers' perceptions of the effectiveness of professional development as related to the successful integration of technology into the classroom?

   $H1_0$: There is no statistically significant difference among teachers grouped according to years of educational experience and the teachers' perceptions of the effectiveness of professional development as related to the successful integration of technology into the classroom.

   $H1_1$: There is a statistically significant difference among teachers grouped according to teachers' years of educational experience and the teachers' perceptions of the effectiveness of professional development as related to the successful integration of technology into the classroom.

2. To what extent, if any, is there a statistically significant difference among teachers grouped according to the teachers' highest degree level earned and the teachers' perceptions of the effectiveness of professional development as related to the successful integration of technology into the classroom?

   $H2_0$: There is no statistically significant difference among teachers grouped according to teachers' highest degree level earned and the teachers' perceptions of the effectiveness of professional development as related to the successful integration of technology into the classroom.

   $H2_1$: There is a statistically significant difference among teachers grouped according to teachers' highest degree level earned and the teachers' perceptions of the

effectiveness of professional development as related to the successful integration of technology into the classroom.

3. To what extent, if any, is there a statistically significant relationship between the teachers' self-assessed technology usage and the teachers' perceptions of the effectiveness of professional development as related to the successful integration of technology into the classroom?

   $H3_0$: There is no statistically significant relationship between teachers' self-assessed technology usage and the teachers' perceptions of the effectiveness of professional development as related to the successful integration of technology into the classroom.

   $H3_1$: There is a statistically significant relationship between teachers' self-assessed technology usage and the teachers' perceptions of the effectiveness of professional development as related to the successful integration of technology into the classroom.

Description of the Sample

The sample consisted of teachers in northwestern New Jersey who completed the survey. The surveys were submitted anonymously online through a link that was e-mailed to a total of 120 chief school administrators in northwestern New Jersey to be distributed to their certificated staff and through some direct e-mail correspondence to teachers who had publicly known e-mail addresses. The exact number of chief school administrators who forwarded the survey via e-mail is unknown. The first page of the survey described the study and requested consent from the participant and then allowed or denied access to the remainder of the survey based on whether the respondents consented to participate. In total, Qualtrics recorded 118 survey responses, with

97 surveys marked as finished, eight test surveys, and the 13 remaining surveys at varying levels of completion. Assuming all 1,879 certificated educators in northwestern New Jersey received the online survey invitation, with 97 marked as completed by Qualtrics, the response rate is 5.2%. Due to the quantity of returned email invitations, denied requests to forward the survey to staff members, and invalid email addresses, the number of people who actually received the survey is possibly less. For the purposes of this study, only the surveys marked as finished were considered.

The data from the survey were analyzed using both Qualtrics and IBM SPSS Statistics 24. The biographical data were used to determine the respondents' highest degree earned and number of years in education. These data helped to contextualize the findings and identify differences between the variables. Other factors, including race, gender identity, and income, were not considered for this study.

The survey's demographic questions asked respondents several questions regarding to indicate the highest degree they had earned. More than 65% of the respondents held advanced degrees. The data were almost evenly divided with about 30% of respondents in each category of bachelor's degree, master's degree, and a combined group of master's degrees plus thirty credits, professional degree, or doctoral degree.

The biographical questions in the survey asked respondents to indicate the number of years they had worked in an educational setting. Relevant to the personal demographics, 10% of respondents had been in education for 5 or fewer years. Of the teachers who responded, 75% had been in education for more than 10 years (see Table 1).

Table 1

Years Worked in an Educational Setting

	Years	%	Count
1	0–5	10%	9
2	6–10	19%	17
3	11–15	22%	20
4	16–20	21%	19
5	21–25	12%	11
6	26–30	4%	4
7	30+	10%	9
	Total	100%	89

The demographic section of the survey revealed the respondents' highest degree level earned and years in the education field. The greatest quantity of respondents held a master's degree or better and had taught for 11–15 years. Individualized results for cross-tabulations of each of the demographic groups are located in the appendix.

Summary of the Results

The survey offered insight into the demographics of the respondents. Related to the personal demographics, this section revealed the respondents' highest degree level earned and the number of years each had spent in the education field. The responses to various survey questions offered an interesting look at the perceptions of a sample of teachers in northwestern New Jersey. The number of surveys returned was below the expected response rate, but those returned offer useful insight into teachers' perceptions of technology usage. This section revealed the respondents' highest degree earned and years in the education field. The majority of respondents held a master's degree or more and had been teaching for 11–15 years.

The results of this research survey indicate that more than 75% of the teachers surveyed believed that most forms of technology would improve their teaching and that more than 85% of teachers indicated that technology has changed the way they teach. More than 70% of the teachers surveyed indicated that school systems expect teachers to use new technologies without offering them formal training and that too much technological change comes too fast without teachers being offered enough support. More than 75% of respondents expressed an urgent need or greater for more options for professional development in the area of technology.

The practical significance of this finding is that, according to the teachers surveyed, professional development is not providing them with the level of assistance that they need to integrate technology into the classroom. This study was conducted to determine the perceptions of teachers' regarding the effectiveness of professional development as related to the integration of technology into the curriculum which is necessary considering the recent legislation enacted by the State of New Jersey requiring the formation of a task force to improve professional development for technology use in schools (New Jersey Assembly, 2015). The results of this study provide new information regarding the perceptions of teachers of the effectiveness of professional development and that there are significant relationships between teachers' perceptions and their years in education, highest degree level earned, and self-assessed technology usage level. This information may assist school district administrators in New Jersey as they are charged with making New Jersey a leader in the utilization of technology (New Jersey Assembly, 2015).

The empirical significance of this study is that the results show teachers' perceptions of the effectiveness of current professional development offered in school districts which may offer a baseline for the task force created by the New Jersey legislation (New Jersey Assembly, 2015).

Previous literature also indicated a lack of quality effective professional development as a barrier to successfully integrating technology into the classroom (Boston Consulting Group, 2014; Broussard, 2009; Dede, 2014; Dindar et al., 2012; Fullerton, 2013; Kee et al., 2012; Keppler, Weiler, & Maas, 2014; NCES, 2010; Roth, 2014; Thompson, 2015; Unger & Tracey, 2013). Little research can be located regarding teachers' perceptions of professional development that is effective for facilitating the integration of technology into the classroom (Boston Consulting Group, 2014; Wolf et al., 2011). The indications are that regardless of their age, years of experience in education, self-proclaimed level of experience with technology, or teaching assignment**,** respondents overwhelmingly desired additional professional development training, support, access, and opportunities in the use of technology.

The theoretical significance of this study is that school district administrators may use the results to improve the professional development opportunities provided to their educators. The theoretical framework was social constructivism which, like current education theories, is based on knowledge scaffolding, using critical thinking, employing meaningful reflection, and including social interaction (Almala, 2005). Teachers stated that professional development selected by school district administrators is often contrary to the format teachers find helpful (Boston Consulting Group, 2014). Professional development is identified as satisfactory and improving by only a small percentage of teachers with teachers stating that professional development selected by school district administrators is often contrary to the format that teachers find helpful (Boston Consulting Group, 2014). This is significant because professional development should be a learning opportunity for teachers to improve their ability to integrate technology into the classroom.

Detailed Analysis

Data collected using the survey were analyzed using Excel and IBM SPSS Statistics 24 to look for significant statistical differences. The biographical data in the survey asked respondents to indicate the number of years they had worked in an educational setting. Almost 30% of respondents had been in education for 10 or fewer years. Of the teachers responding, 75% had been in education for more than 10 years.

Research question one. The first research question asked: To what extent, if any, is there a statistically significant difference among teachers grouped according to years of experience and the teachers' perceptions of the effectiveness of professional development as related to the successful integration of technology into the classroom? The null hypothesis is that there is no statistically significant difference among teachers grouped according to years of educational experience and the teachers' perceptions of the effectiveness of professional development as related to the successful integration of technology into the classroom. The analysis of variance (ANOVA) tested for significance between years in education and construct related to teachers' perceptions of effective professional development in the area of technology integration into the curriculum from the Quick Teacher Technology Survey (PowerUp What Works, n.d.). The mean score for the 'I think' responses from Section 3: Opinions and Attitudes about Technology Integration were the values used for teachers' perceptions of the effectiveness of professional development as related to the successful integration of technology into the classroom. The survey items from Section 3: Opinions and Attitudes about Technology Integration were used for teachers' perceptions of the effectiveness of professional development as related to the successful integration of technology into the classroom are

displayed in Table 2.

Table 2

Survey Items Measuring Self–Assessed Technology Usage Constructs

Section 3: Opinions and Attitudes on Technology Integration	Strongly Agree … Strongly Disagree
Electronic media will replace printed text within five years	4 3 2 1
Most technology would improve my ability to teach	4 3 2 1
Technology has changed the way that I teach	4 3 2 1
Students are more knowledgeable than I am when it comes to technology	4 3 2 1
School systems expect us to learn new technologies without formal training	4 3 2 1
There is too much technological change coming too fast without enough support for teachers	4 3 2 1
Technology is a good tool for collaboration with other teachers when building unit plans	4 3 2 1
Technology is unreliable	4 3 2 1

ANOVA is a powerful test, and the data approximate normal distribution for the scores of the Quick Teacher Technology Survey. A study was conducted to test the null hypothesis that that there is a statistically significant difference among teachers grouped according to years of educational experience, namely novice, experienced, and veteran, and the teachers' perceptions of the effectiveness of professional development as related to the successful integration of technology into the classroom (See Table 3). A descriptive analysis of the data showed the number of teachers per years in education grouping, standard deviations, and the mean number of teachers per years in education grouping. The results are presented in Table 4.

Table 3

Groupings by Years of Experience in Education

Grouping Label	Years Employed in Education
Novice	0–10
Experienced	11–20
Veteran	21 or more

Table 4

Descriptive Statistics

Dependent Variable: Perception Score

Years worked in an educational setting	Mean	Std. Deviation	N
Novice	2.2493	.40046	26
Experienced	1.9647	.34881	39
Veteran	2.0820	.32554	22
Total	2.0794	.37543	87

Table 5

One-Way ANOVA Null Hypothesis With Variables

Perception Score

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1.263	2	.632	4.887	.010
Within Groups	10.858	84	.129		
Total	12.122	86			

A one-way ANOVA was used to compare the teachers' perceptions of the proficiency of the effectiveness of professional development as related to the integration of technology in the

classroom with the number of years they have been employed in an educational setting (See Table 5). The results indicated statistically significant differences across the three ranges of years employed, F (2, 84) = 4.89, p =.010, η^2 = .104. The measure of effect size was .104 indicating a weak effect size. The strength of the relationship between the groupings of years in education and teachers' perceptions, as assessed by η^2, was weak, with the groupings of years in education accounting for 10% of the variance in the perceptions of teachers. The results of the ANOVA are presented in Table 6.

Table 6

Tests of Between-Subjects Effects

Dependent Variable: Perception Score

Source	Type III Sum of Squares	*df*	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	1.263[a]	2	.632	4.887	.010	.104
Intercept	361.821	1	361.821	2799.086	.000	.971
Years in an Educational Setting	1.263	2	.632	4.887	.010	.104
Error	10.858	84	.129			
Total	388.313	87				
Corrected Total	12.122	86				

a. R Squared = .104 (Adjusted R Squared = .083)

b. Computed using alpha = .05

Multiple comparisons were conducted using Tukey's HSD test. The computed pairwise comparisons are shown in Table 7.

Table 7

Multiple Comparisons

Dependent Variable: Perception Score
Tukey HSD

(I) Years in an Educational Setting	(J) Years in an Educational Setting	Mean Difference (I–J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Novice	Experienced	.2846*	.09103	.007	.0674	.5018
	Veteran	.1673	.10415	.248	-.0812	.4158
Experienced	Novice	-.2846*	.09103	.007	-.5018	-.0674
	Veteran	-.1172	.09587	.443	-.3460	.1115
Veteran	Novice	-.1673	.10415	.248	-.4158	.0812
	Experienced	.1172	.09587	.443	-.1115	.3460

Based on observed means.

The error term is Mean Square(Error) = .129.

*. The mean difference is significant at the .05 level.

There was a statistically significant difference in the means between the years in education ranges of novice and experienced teachers. No statistically significant differences were found between the teacher' perceptions and novice and veteran, or experienced and veteran years employed in education. The average perception score of the novice teachers regarding the effectiveness of professional development as related to the integration of technology into the classroom was greater than the average perceptions of the experienced teachers. The mean difference between the average number of educators in the novice and experienced years of experience groupings is significant at the .05 level. The null hypothesis that there would be no statistically significant difference in the perceptions of teachers regarding the effectiveness of

professional development as related to the integration of technology in the classroom and the teachers' years of experience was rejected.

Research question two. The second research question asked: To what extent, if any, is there a statistically significant difference among teachers grouped according to the teachers' highest degree level earned and the teachers' perceptions of the effectiveness of professional development as related to the successful integration of technology into the classroom? The null hypothesis is that there is no statistically significant difference among teachers grouped according to the teachers' highest degree level earned and the teachers' perceptions of the effectiveness of professional development as related to the successful integration of technology into the classroom. The mean score for the 'I think' responses from Section 3: Opinions and Attitudes about Technology Integration were the values used for teachers' perception scores, as shown in Table 8. The analysis of variance (ANOVA) tested for significance between groupings of teachers' highest degree level earned and questions related to effective professional development in the area of technology integration into the curriculum regarding teachers' perceptions from Section 3 of the Quick Teacher Technology Survey (PowerUp What Works, n.d.).

Table 8

Survey Items Measuring Self-Assessed Technology Usage Constructs

Section 3: Opinions and Attitudes on Technology Integration	Strongly Agree … Strongly Disagree
Electronic media will replace printed text within five years	4 3 2 1
Most technology would improve my ability to teach	4 3 2 1
Technology has changed the way that I teach	4 3 2 1
Students are more knowledgeable than I am when it comes to technology	4 3 2 1
School systems expect us to learn new technologies without formal training	4 3 2 1
There is too much technological change coming too fast without enough support for teachers	4 3 2 1
Technology is a good tool for collaboration with other teachers when building unit plans	4 3 2 1
Technology is unreliable	4 3 2 1

ANOVA is a powerful test, and the data approximate normal distribution for the scores of the Quick Teacher Technology Survey. A study was conducted to test the null hypothesis that that there is a statistically significant difference among teachers grouped according to teachers' highest degree level earned, namely Bachelor's degree, Master's degree, and Post-Master's degree, and the teachers' perceptions of the effectiveness of professional development as related to the successful integration of technology into the classroom (See Table 9).

Table 9

Groupings by Highest Degree Level Earned

Grouping Label	Highest Degree Level Earned
Bachelor's degree	Bachelor's degree
Master's degree	Master's degree
Post-Master's degree	Master's degree plus 30 credits, Professional degree, and/or Doctoral degree

A descriptive analysis of the data showed the number of teachers per highest degree level earned grouping, standard deviations, and the mean number of teachers per years in education grouping. The results are presented in Table 10.

Table 10

Descriptive Statistics

Dependent Variable: Perception Score

Degree Groupings	N	Std. Deviation	Mean
Bachelor's Degree	31	.41993	2.0132
Master's Degree	29	.31778	2.1293
Post-Master's degree	27	.38141	2.1019
Total	87	.37543	2.0794

The analysis of variance (ANOVA) tested for significance between teachers' highest degree level earned and questions related to effective professional development in the area of technology integration into the curriculum regarding teachers' perceptions of importance in Section 1 of the Quick Teacher Technology Survey (PowerUp What Works, n.d.). ANOVA is a powerful test, and the data approximate normal distribution for the scores of the Quick Teacher Technology Survey. Regarding the association between teachers' highest degree level earned

and the construct relating to effective professional development in the areas of technology, no statistically significant difference was perceived. Evidence at the alpha level of significance was not sufficient to reject the null hypothesis in favor of the alternate hypothesis that there was is a statistically significant difference between teachers' perceptions of the effectiveness of current professional development as related to the successful integration of technology into the classroom depending upon teachers' highest degree level earned.

Table 11

One-Way ANOVA Null Hypothesis With Variables

Proficiency Score

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.222	2	.111	.782	.461
Within Groups	11.900	84	.142		
Total	12.122	86			

A one-way ANOVA was used to compare the teachers' perceptions of the proficiency of the effectiveness of professional development as related to the integration of technology in the classroom with the teachers' highest degree level earned. The results, displayed in Table 11, indicated no statistically significant differences across the three ranges of highest degree level earned, F (2, 84) = .782, p = .461. The null hypothesis that there would be no statistically significant difference in the perceptions of teachers regarding the effectiveness of professional development as related to the integration of technology in the classroom and the teachers' highest degree level earned cannot be rejected. The calculation for p value for the survey questions related to the highest degree level earned by the respondents is .461, which indicates there is not a statistically significant difference between the respondents' highest degree level

earned and the respondents' perceptions of professional development in the area of technology regarding proficiency.

Research question three. The third research question asked: To what extent, if any, is there a statistically significant relationship between the teachers' self-assessed technology usage and the teachers' perceptions of the effectiveness of professional development as related to the successful integration of technology into the classroom? There is no statistically significant relationship between teachers' self-assessed technology usage and the teachers' perceptions of the effectiveness of professional development as related to the successful integration of technology into the classroom.

Using teachers' responses to the Quick Teacher Technology Survey questions to calculate the mean scores for proficiency from Section 1 of the survey for each respondent gave the values used for teachers' self-assessed technology usage score to test significance throughout the analysis.

Table 12

Survey Items Measuring Technology Usage Constructs

Section 1: General Technology Use in Education Competency	Proficiency Weak…Strong
Learning how to use a new application (software and programs)	1 2 3
Acting as a guide for students when researching on the internet	1 2 3
Troubleshooting problems that occur when using technology	1 2 3
Integrating technology into daily instruction	1 2 3
Using technology to differentiate instruction	1 2 3

The mean score for the I think responses from Section 3: Opinions and Attitudes about Technology Integration were the questions used for teachers' perceptions shown in Table 2. These two sets of values were used in a correlational analysis to investigate the relationship between teacher self-assessed technology usage level and perception of the effectiveness of professional development as related to the integration of technology into the classroom.

Table 13

Survey Items Measuring Self-Assessed Technology Usage Constructs

Section 3: Opinions and Attitudes on Technology Integration	Strongly Agree … Strongly Disagree
Electronic media will replace printed text within five years	4 3 2 1
Most technology would improve my ability to teach	4 3 2 1
Technology has changed the way that I teach	4 3 2 1
Students are more knowledgeable than I am when it comes to technology	4 3 2 1
School systems expect us to learn new technologies without formal training	4 3 2 1
There is too much technological change coming too fast without enough support for teachers	4 3 2 1
Technology is a good tool for collaboration with other teachers when building unit plans	4 3 2 1
Technology is unreliable	4 3 2 1

The computed correlation coefficient, r, revealed a statistically significant relationship between teacher self-assessed technology usage level and perception of the effectiveness of professional development as related to the integration of technology into the classroom, r (87) = .325, p = .003. The result indicates a moderate positive relationship between teachers' self-assessed technology usage level and their perceptions of professional development as related to the integration of technology into the classroom. Table 8 shows the correlation between teacher self-assessed technology usage level and perception of the

effectiveness of professional development as related to the integration of technology into the classroom. The null hypothesis was rejected.

Table 14

Correlations

		Section 3 Think Score	Proficiency Score
Technology Usage Score	Pearson Correlation	1	.325**
	Sig. (2-tailed)		.003
	Sum of Squares and Cross-products	12.122	4.786
	Covariance	.141	.058
	N	87	84
Perception Score	Pearson Correlation	.325**	1
	Sig. (2-tailed)	.003	
	Sum of Squares and Cross-products	4.786	18.125
	Covariance	.058	.218
	N	84	84

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

Results

The first research question asked: To what extent, if any, is there a statistically significant difference among teachers grouped according to years of experience and the teachers' perceptions of the effectiveness of professional development as related to the successful integration of technology into the classroom? The analysis of variance (ANOVA) tested for significance between years in education and questions related to effective professional development in the area of technology integration into the curriculum regarding teachers'

perceptions. Regarding the association between years in education and the questions relating to effective professional development in the areas of technology, a statistically significant difference was perceived. Evidence at the alpha level of significance was sufficient to reject the null hypothesis in favor of the alternate hypothesis that there was is a statistically significant difference between teachers' perceptions of the effectiveness of current professional development as related to the successful integration of technology into the classroom depending upon years in an educational setting. The results indicated statistically significant differences across the three ranges of years employed, F (2, 84) = 4.89, p = .010, η^2 = .104. The strength of the relationship between the teachers' perceptions and their years worked in education was weak.

The second research question asked: To what extent, if any, is there a statistically significant difference among teachers grouped according to the teachers' highest degree level earned and the teachers' perceptions of the effectiveness of professional development as related to the successful integration of technology into the classroom? The analysis of variance (ANOVA) tested for significance between teachers' highest degree level earned and questions related to effective professional development in the area of technology integration into the curriculum regarding teachers' perceptions. Regarding the association between teachers' highest degree level earned and the questions relating to effective professional development in the areas of technology, no statistically significant difference was perceived.

A one-way ANOVA was used to compare the teachers' perceptions of the proficiency of the effectiveness of professional development as related to the integration of technology in the classroom with the teachers' highest degree level earned. The results indicated no statistically significant differences across the three ranges of highest degree level earned, F (2, 84) = .782, p = .461, η^2 = .018. Evidence at the alpha level of significance was not sufficient to reject the null

hypothesis in favor of the alternate hypothesis that there was is a statistically significant difference between teachers' perceptions of the effectiveness of current professional development as related to the successful integration of technology into the classroom depending upon teachers' highest degree level earned.

The third research question asked: To what extent, if any, is there a statistically significant relationship between the teachers' self-assessed technology usage and the teachers' perceptions of the effectiveness of professional development as related to the successful integration of technology into the classroom? A correlational analysis to investigate the relationship between teacher self-assessed technology usage level and perception of the effectiveness of professional development as related to the integration of technology into the classroom was conducted. The computed correlation coefficient, r, revealed a statistically significant relationship between teacher self-assessed technology usage level and perception of the effectiveness of professional development as related to the integration of technology into the classroom, r (87) = .325, p = .003. The result indicates a moderate positive relationship between teachers' self-assessed technology usage level and their perceptions of professional development as related to the integration of technology into the classroom.

Summary

The results of the data analysis are presented in this chapter. The researcher's main goal was to determine teacher's perceptions of the effectiveness of professional development that addresses the integration of technology into the classroom. The survey data were collected and then analyzed in response to the research questions posed in Chapter One of this dissertation. The result of an analysis of previous research indicated that the lack of quality, effective professional development is a barrier to the successful integration of technology into the

classroom (Boston Consulting Group, 2014; Broussard, 2009; Dede, 2014; Dindar et al., 2012; Fullerton, 2013; Kee et al., 2012; Keppler et al., 2014; NCES, 2010; Roth, 2014; Thompson, 2015; Unger & Tracey, 2013). With this study, this researcher addressed the lack of prior research combining the factors of years of teaching experience, highest degree level earned, or self-proclaimed level of experience with technology and their differences with teachers' perceptions of the effectiveness of professional development on integration of technology into classrooms. A survey was used as the instrument for collecting the information for this study. The response rate was low at 4.6% — 87 usable responses from 1,879 potential respondents— and consequently some of the subgroups explored in the study were very small.

The researcher asked three research questions and tested each one with a null hypothesis. Regarding the association between years in education and the questions relating to effective professional development in the area integrating technology into the classroom, using the analysis of variance (ANOVA) test, a statistically significant difference was perceived. Evidence at the alpha level of significance was sufficient to reject the null hypothesis in favor of the alternate hypothesis that there is a statistically significant difference among teachers grouped according to teachers' years of educational experience and the teachers' perceptions of the effectiveness of professional development as related to the successful integration of technology into the classroom. The results indicated statistically significant differences across the three ranges of years employed, F (2, 84) = 4.89, p = .010, η^2 = .104. The strength of the relationship between the teachers' perceptions and groupings of their years worked in education was weak.

The analysis of variance (ANOVA) tested for an association between teachers' highest degree level earned and the questions relating to effective professional development in the areas of technology, and no statistically significant difference was perceived. Evidence at the alpha

level of significance was not sufficient to reject the null hypothesis in favor of the alternate hypothesis that there is no statistically significant difference among teachers grouped according to teachers' highest degree level earned and the teachers' perceptions of the effectiveness of professional development as related to the successful integration of technology into the classroom. The results indicated no statistically significant differences across the three ranges of highest degree level earned, F (2, 84) = .782, p = .461, η^2= .018.

The third research question asked: To what extent, if any, is there a statistically significant relationship between the teachers' self-assessed technology usage and the teachers' perceptions of the effectiveness of professional development as related to the successful integration of technology into the classroom? The computed correlation coefficient, r, revealed a statistically significant relationship between teacher self-assessed technology usage level and perception of the effectiveness of professional development as related to the integration of technology into the classroom, r (87) = .325, p = .003. The result indicates a moderate positive relationship between teachers' self-assessed technology usage level and their perceptions of professional development as related to the integration of technology into the classroom.

This chapter began with an overview of the data analysis procedures, a description of the demographic characteristics of the participating educators, and a description of the reliability of the survey instruments. The responses to each question were examined using both inferential and descriptive statistics, including frequencies, means, and standard deviations. The main focus of the study was to determine if there was significant difference in teacher perceptions in regard to the effectiveness of professional development as related to the integration of technology into the classroom with regard to variables of teachers grouped according to years employed in an

educational setting, teachers grouped according to highest degree level earned, and teachers' self-assessed technology usage score. The data suggested that there was a statistical significance in teacher perceptions in two of the three main variables considered, teachers grouped according to years employed in an educational setting and self-assessed technology usage score. The relationship between teacher perceptions and teachers grouped according to highest degree level earned was not statistically significant.

The next chapter will discuss how the information gained by this research study will contribute to the lack of quantitative data in existence regarding professional development models related to the effective integration of technology into the classroom to significantly change teacher perception and practice. Extended, effective professional development in technology must be offered to help teachers become more proficient in their use of technology and to improve their ability to integrate technology in the curriculum and into the classroom. This study may be used to assist school district administrators in improving professional development opportunities concerning the use of technology to enhance the integration of technology into the classroom to improve learning in the classroom and promote student achievement. Findings are presented in the next chapter to extend the knowledge base contained within the accompanying literature review. In addition, suggestions for future practice and further research are discussed.

Chapter 5: Conclusions and Discussion

As described in previous chapters, this study was conducted to assist school district decision makers in determining best practices for their technology integration and professional development. This study was completed to determine a baseline in New Jersey of the perceptions of teachers of the effectiveness of professional development as related to the integrating technology in the classroom and whether it would be different based on the makeup of the staff. Educators with different levels of technology usage, degree levels earned, or years of experience in education perceive the effectiveness of professional development differently were the variates considered for this study.

Researched for this study were many of the same questions that the legislature of New Jersey hopes that Bill 1685 will investigate, including determining the readiness of educators to use technology in the classroom, the current level of technology usage, and the professional development that teachers perceive as effective for the infusion of technology into the classroom and the curriculum (New Jersey Assembly, 2015, para. 1). Additionally, this researcher explored the current use of a variety of educational technologies in some northwestern New Jersey classrooms, including the use of technology as required by Bill 1685 (New Jersey Assembly, 2015, para. 1). This study builds on work by the Boston Consulting Group (2014) identifying a gap in research regarding the integration of technology in the classroom. This study is useful for school districts that are making decisions about providing professional development for teachers that will help them to integrate technology into their classrooms.

Summary of the Results

Developing an understanding of teachers' perceptions of professional development regarding use of technology in the classroom is beneficial for assisting school districts with the

decisions about how to spend technology and professional development budget dollars. Evidence showed that there is a statistically significant difference among teachers grouped according to teachers' years of educational experience and the teachers' perceptions of the effectiveness of professional development as related to the successful integration of technology into the classroom. The strength of the relationship between the teachers' perceptions and groupings of their years worked in education was weak. Evidence showed that there is no statistically significant difference among teachers grouped according to teachers' highest degree level earned and the teachers' perceptions of the effectiveness of professional development as related to the successful integration of technology into the classroom. Results revealed a statistically significant relationship between teacher self-assessed technology usage level and perception of the effectiveness of professional development as related to the integration of technology into the classroom.

The information gathered may help school district administrators make recommendations related to assisting teachers with integrating educational technology effectively in similar public school classrooms. Recognizing methods of improving the professional development necessary to advance the use of information and communication technology to enhance student achievement will benefit all the stakeholders in education, especially the teachers and students. Armed with information about the conditions teachers perceive as necessary for integrating technology into the classroom, school district administrators will be better able to meet the needs of their staff.

Discussion of the Results

The research question studied was: To what extent, if any, do teachers perceive professional development related to the successful integration of technology into the classroom

as effective? The study evaluated the need for improved professional development in technological literacy to facilitate the integration of technology in classrooms. The research questions evaluated professional development for technology integration as it related to several variables, evaluating for statistically significant difference s between the perceptions of teachers and the teachers' years of educational experience, their highest degree level earned, and their self-assessed technology usage level to determine the baseline before changes are implemented by the legislation. This study builds on a gap identified by the Boston Consulting Group (2014) regarding the integration of technology in the classroom. Previous research indicated that teachers found that professional development was not sufficient to improve integration and the lack of effective professional development was a barrier to integrating technology into the classroom (Boston Consulting Group, 2014; Broussard, 2009; Dede, 2014; Dindar et al., 2012; Fullerton, 2013; Kee et al., 2012; Keppler et al., 2014; NCES, 2010; Roth, 2014; Thompson, 2015; Unger & Tracey, 2013).

There was a statistically significant relationship between the teachers' perceptions and their years worked in education, the strength of which was weak. The most statistically significant relationship was between novice teachers and experienced teachers. The results indicated no statistically significant differences across the three ranges of highest degree level earned. The analysis of the results indicates a statistically significant relationship between teachers' self-assessed technology usage level and their perceptions of the effectiveness of professional development as related to the integration of technology into the classroom. The moderate positive relationship indicates that the higher the self-assessed technology usage score, the higher the teachers' perceptions score.

Related to the years worked in education groupings, novice teachers have a higher perception score the effectiveness of professional development as related to the integration of technology into the classroom. Comparing the means of the three groups of years in education, the greatest difference is between the novice and experienced groups of teachers. Interpreting this result could mean that newer teachers are more comfortable using technology in general, based on the availability of technology during their own schooling and development (Atjonen & Li, 2006; Gurung & Rutledge, 2014; Koehler and Mishra, 2009; Prensky, 2001; Thomspon, 2013). Evaluating the questions used to formulate the perception score, several of them include

A large majority of respondents recognizing a need for more options in professional development identifies a problem in the current state of technology related training. The questions that provide the perception score (shown in Table 2) include several regarding the need for more training or negatively relating to the current state of technology in school districts. Further, more in-depth research is required to determine what factors affect teachers' perceptions of the effectiveness of professional development related to the integration of technology into the classroom. Twenty percent of educators responded that they had received minimal to no training on the integration of technology into instruction. Considering the governmental initiatives to improve the level of technology in classrooms and the push for more professional development for teachers in the area of technology integration, this statistic is alarming.

Teachers are charged with preparing students for high-stakes standardized tests that use technology to assess student achievement; however, teachers do not perceive their technology training as being adequate. At present, the state of New Jersey uses the standardized assessments created by the PARCC (Achieve, 2013), and the New Jersey Department of Education expects

students to complete standardized assessments online where students' results are dependent upon their ability to navigate a computer efficiently. Teachers must prepare students to use technology effectively to successfully determine their proficiency in language arts and mathematic, in addition to teaching students the content knowledge necessary to be proficient. Teachers are clearly interested in receiving more training in technology, as more than 50% of the teachers who participated in this study continued to seek out professional development opportunities and information sharing with colleagues. Teachers in this study recognized that additional professional development in technology is required if technology integration is to be successfully addressed. Prior research shows that current professional development for technology usage is not effective to improve integration (Boston Consulting Group, 2014; Broussard, 2009; Dede, 2014; Dede, 2014; Dindar et al., 2012; Fullerton, 2013; Kee et al., 2012; NCES, 2010; Roth, 2014; Thompson, 2015; Unger & Tracey, 2013). Beauchamp et al. (2015) found that teachers prefer a more personalized, flexible format of professional development to the linear presentation models currently used. While legislators and decision makers for education create legislation, policies, and recommendations regarding the manner in which educators should use technology, more necessary is the establishment of policies and professional development to effectively support educators in meeting these goals (Beauchamp et al., 2015; Blackwell, Lauricella, & Wartella, 2016).

An overarching theme for teachers responding to this survey was the need for more time to learn, practice, and advance their knowledge of the technology available to them. Although it is apparent from the survey data that teachers have access to technology in their classrooms, it is also obvious that they prefer additional access and they do not believe they are fully capable of using the technology available to them to the fullest extent under the current conditions. The

results show that educators overwhelmingly desire more professional developments opportunities concerning technology integration into the classroom regardless of any number of variables including their age, years of experience, highest degree level earned, teaching assignment, and self-assessed technology usage levels.

The results of this study may be used to develop an understanding of teachers' perceptions of the effectiveness of currently offered professional development related to the integration of technology in the classroom. The baseline of teachers' perceptions is that professional development as related to the integration of technology into the classroom is ineffective. There is a significant difference in these perceptions, however, based on the educators' years of experience in the classroom and the self-assessed levels of technology usage of the educators. This study is noteworthy because it may be used to provide the ground work for a task force created by New Jersey legislators aimed at improving technology education in the State of New Jersey (New Jersey Assembly, 2015).

This researcher realized that the perceptions of teachers are important to consider when selecting professional development aimed at improving their skills and abilities. Prior knowledge, past experiences, and interests of the learners provide the knowledge scaffolding for new learning, as described in the theoretical framework for this study (Almala, 2005; Johnson, 2014; Robertson, 2011). The professional development provided for teachers must prepare them to integrate technology into the classroom effectively, thereby improving the potential for their students to be ready to live and work in this technological, global society (Okojie & Olinzock, 2013; Roth, 2014; Wolf et al., 2011). Prior research indicates that much of educational technology is used as basic skills practice, although it is more effective when fully integrated to support student-centered instruction (Blackwell et al., 2016). This researcher recognized that

teachers overwhelming desire to improve their technology integration in the classroom and to participate in more effective professional development to that end.

Discussion of the Results in Relation to the Literature

Social constructivism is the theoretical lens that was used to focus this study, and the research methodology for the study was a quantitative survey of preschool through eighth-grade teachers in elementary schools located in northwestern New Jersey. This study was based on the technology proficiency requirements for students and teachers set by the United States Department of Education called The Blueprint for Learning (United States Department of Education, 2010a), which calls for professional development for teachers that helps teachers improve student learning with resources and materials that are aligned with the college and career readiness standards. The National Education Technology Plan (United States Department of Education, 2017; United States Department of Education, 2010) also calls for improved, effective, ongoing professional development for teachers in efforts to completely integrate the technology plan and transform education. Researchers indicate that a lack of high-quality, effective professional development for teachers is a barrier to the successful integration of technology into the classroom (Boston Consulting Group, 2014; Broussard, 2009; Dede, 2014; Dindar et al., 2012; Erişti et al., 2012; Fullerton, 2013; Kee et al., 2012; Keppler et al., 2014; NCES, 2010; Roth, 2014; Thompson, 2015; Unger & Tracey, 2013).

The study evaluated teachers' perceptions of the effectiveness of professional development to improve the use of technology and to facilitate the integration of technology in classrooms. No previous research was available that connected the perceptions of teachers regarding the effectiveness of professional development as related to the integration of technology into the classroom and educators' self-assessed level of technology usage. There is

research regarding teachers' comfort level with technology and perceptions of professional development (Atjonen & Li, 2006; Koehler and Mishra, 2009), however, technology usage level is a different measure. There is current research related to barriers, formats, and quantities of professional development for technology integration (Beauchamp, Burden, & Abinett, 2015; Larosiliere, Kobelsky, & Mchaney; 2016; Boston Consulting Group, 2014), but this research is not directly related to the demographic factors associated with the present study.

Despite the focus on infusing technology into school districts, there has been little guidance on how to use technology to enhance student performance, leaving many to regard computer usage by students as an afterthought, not as meaningful to the curriculum (American Institutes for Research, 2016; United States Department of Education, 2017; Young & Bush, 2004). Education programs must prepare students to become technologically literate, responsible, and respectful digital citizens in a global community (Achieve, 2013; ACT, 2008; Beauchamp et al., 2015; Gorlewski, 2013). School districts increase the quantity of technology without assisting teachers in understanding the ways that use of technology within the classroom helps to reach the curricular goals and why teachers should use technology in this manner to meet the pedagogical needs of the students in order to advance student achievement (Young & Bush, 2004).

Although the infusion of technology has arguably been occurring for years, determining whether it is a success is difficult (Gao et al., 2009; Kay, 2006; Wozney et al., 2006). Prior research indicates that only a small percentage of teachers believe that professional development is satisfactorily preparing them to use technology in the classroom and that few believe professional development is improving based on time allotted, tools, and resources (Boston Consulting Group, 2014). Although 95% of teachers indicated that they had some level of

training in technology use in the classroom, 48% indicated a desire to learn more about integrating technology into the classroom (Bolkan, 2015). If teachers are to gain confidence and proficiency and improve their ability to integrate technology in the curriculum, they must receive extended, effective professional development in technology (American Institutes for Research, 2016; Broussard, 2009; Kee et al., 2012; Latio, 2009; United States Department of Education, 2017; United States Department of Education, 2010). Teachers must be technologically proficient and have the ability to integrate technology in the curriculum if they are to implement the national technology plan effectively.

In New Jersey, 99.5% of the students taking the PARCC exam completed the assessment online in 2015 (Herold, 2016). Herold (2016) reports that PARCC tests scores were significantly lower when students completed the 2015 PARCC test online as compared to tests completed on paper. Herold found that among students with equivalent demographics and educational backgrounds, those who completed the PARCC test on paper scored an average of 14 points higher than those students who tested online (Herold, 2016, para. 9). The discrepancy between online assessments and on-paper testing of language arts proficiency is an ongoing national problem, as evidenced by the NAEP assessment results, which reveal that only 27% of U.S. students in eighth grade scored at the proficient or higher level on the NAEP in 2011 (Fleming, 2012, para. 10). In New Jersey, there have been statewide concerns and protests over the changes to standardized tests, the grading methods, and the interpretation of the results, but the scores stand as final scores. According to the 2015 online PARCC scores, 57% of third-grade students and 50% of fourth-grade students in this northeastern state are not meeting Common Core State Standards for these grade levels in language arts (State of New Jersey Department of Education, 2015, p. 5). The students' level of proficiency with computer skills and digital

literacy is assessed directly in the State of New Jersey as they participate in the PARCC exam online (Clark, 2016; Herold, 2016). Taking on the role of preparing students for college and career readiness in digital literacy skills in communication and information technologies requires technological proficiency on the part of educators, many of whom do not feel confident in their own use of some of these applications (Boston Consulting Group, 2014; Okojie & Olinzock, 2013; Roth, 2014).

Teacher evaluation linked to student performance as part of the standards based accountability for both teachers and students are a national concern as a result of the development of content and performance based standards for students, standardized assessments of those standards, and the outcomes of these assessments affecting teacher evaluations (Achieve 2013; Dede, 2014). Teacher evaluation also seeks to improve the teacher's own practice by identifying strengths and weaknesses for further professional development, helping teachers learn about, reflect on, and improve their practice (Cooper, 2014; Office of Educational Technology, 2017). Professional development must fulfill the needs that each individual teacher has in order to provide the appropriate, effective training necessary to improve teacher performance Atjonen & Li, 2006; Boston Consulting Group, 2014; Koehler and Mishra, 2009.

This study was completed to determine the baseline perceptions of New Jersey teachers of the effectiveness of professional development as related to the integration of technology into the classroom and if it would be different based on the demographics of the staff, including different levels of technology usage, degree levels earned, or years of experience in education. There was no previous research gauging the current level of teachers' perceptions of professional development in New Jersey prior to the introduction of the legislation to improve professional development. This study was presented to determine teachers' perceptions of the effectiveness

of professional development that addresses technology use in the classroom and of the successful integration of technology into the classroom.

Limitations

As discussed in Chapter Three, limitations of this study included the possibility that respondents might not answer truthfully and inherent errors in the survey itself, including wording and answer selection of the survey format. The limitations of survey research included possible difficulties with reaching participants depending upon their location, availability, and reliability. Reaching the teachers became problematic because this researcher distributed the survey in August and September. The surveys were submitted anonymously online through a link that was e-mailed to a total of 120 chief school administrators in northwestern New Jersey to be distributed to their certificated staff and through some direct e-mail correspondence to teachers who had publicly known e-mail addresses. A majority of the chief school administrators replied with an automatic out-of-office message. Several administrators replied stating that surveys would not or could not be distributed due to district policies. The exact number of chief school administrators who forwarded the survey via e-mail is unknown. In total, Qualtrics recorded 118 survey responses, with 97 surveys marked as finished, eight test surveys, and the 21 remaining surveys at varying levels of completion. For the purposes of this study, only the surveys marked as finished were considered. The response rate was below the expected rate, but the results are still viable.

The survey instruments, The Locator Self-assessment for Teachers survey (EdTech Locator for Technology Implementation, 2009) and The Quick Teacher Technology Usage Survey (PowerUp What Works, n.d.), used did not investigate additional factors contributing to the problems facing teachers in their quest to effectively integrate technology into the classroom,

which included old, unusable, and outdated equipment; lack of access to equipment; and the lack of effective professional development regarding the use of technology in the classroom. Additional contributing factors included low teacher self-efficacy, insufficient teacher experience with technology, and teacher lack of confidence in their ability to use technology in the classroom. A survey assessing all of these factors would take so much additional time that it might be difficult to get participants to complete the survey accurately. Conducting an exhaustive survey considering every possible technology tool, quantity, and quality of training for each tool, and the level of interest teachers have in pursuing these additional tools and training for them, would be time prohibitive.

The dataset poses a potential limitation for generalizability as the respondents represent the perceptions of educators in only one state. The same survey given in a different state or region of a large state could produce different results. A future study may benefit from expanding the study to multiple regions or multiple states and or countries. Increasing the sample to include educators from secondary schools could provide further insight across the full spectrum of public school education.

Implications of the Results for Practice, Policy, and Theory

The implications of this study include the wisdom of offering support for providing professional development training for teachers to increase their knowledge of technology tools and the integration of technology into the classroom with minimal financial burden to local school districts and improved learning opportunities for teachers. New Jersey legislation called for the creation of a task force to determine the changes necessary for professional development to better address the needs of both teachers and students regarding technology use in the classroom (New Jersey Assembly, 2015, para. 1). The literature search conducted for this study

did not yield any current research gauging teachers' perceptions of the effectiveness of professional development in New Jersey prior to the introduction of the legislation to improve professional development (New Jersey Assembly, 2015, para 1). The results of this study could provide the ground work for the task force providing a baseline from which to examine perceptions of New Jersey teachers of professional development as related to the integration of technology into the classroom.

Reform models often gain support and momentum prior to full investigation and research into the appropriate method of ensuring success. The results of this study identified that teachers' perceptions are different depending upon the range of years they have worked in an educational setting. The most significant difference is between novice and experienced teachers, with no significant difference between either group and veteran teachers.

A benefit of this study is that the results provide support for using colleagues to assist with mentoring, coaching, and training for school districts to provide professional development opportunities that are effective and requested by educators. For example, data collected in this study suggest that teachers would benefit from having more time to practice with technology tools already available to them and from collaborating with peers regarding technology. This practice time with technology is desired across the board and does not change based on the demographics of the educators. These activities do not require an outflow of financial support but require the coordination of professional learning communities with members offering one another support and training in the use of a variety of technologies (Kopcha, 2012). Another option is for the school district to implement job-embedded professional development, which can take the form of a teacher alone, a dual teacher situation, or a group providing ongoing assessment and problem solving within the work environment that is working toward teacher

improvement. Using job-embedded professional development helps the teacher to improve the infusion of technology into the curriculum through reflection and personal improvement within the work environment (Cooper, 2014). Professional development activities are most successful when they are offered within the teachers' home school district in a way that is continuous, reflective, and supportive (Hennessy & London, 2013).

Another way that the results of this study may assist school districts in determining appropriate formats of professional development to improve the integration of technology into the classroom is the suggestion that teachers may benefit from digital literacy coaching. Digital literacy coaches help teachers to integrate technology applications in their classrooms and to facilitate student technology proficiency by working in a personalized manner to provide the training and support that each individual teacher needs. Coaches encourage educators to become better teachers by reflecting, focusing, and improving their practice (Neufeld & Roper, 2012, p. 9). Teachers who had used coaches described an improved quality of work from their students as well as increased student engagement (p. 2). Coaching is a more specialized form of professional development personalized for each individual and his or her specific experiences (p. 24). Digital literacy coaches provide support, assistance, and training for school personnel with ongoing, effective instruction throughout the school year. As opposed to spending budgetary dollars on external workshops and training sessions, the digital literacy coach is a peer mentor working within the school district who can advance the knowledge of teachers in a school-specific manner.

Through ongoing, comprehensive professional development, teachers acquire the knowledge and skills necessary to integrate technology into the curriculum while addressing students' needs, developmental levels, and learning styles (Boston Consulting Group, 2014;

Martin et al., 2010; Penuel, 2006; Wolf et al., 2011). The attitude, support, and encouragement of school district administrators helps to encourage and promote the successful integration of technology into the classroom (Boston Consulting Group, 2014; Johnson, 2014; Larosiliere et al., 2016). Effective ways school districts can use technology include fully automating the administrative functions, school information processing, data collection, and communications to allow more focus on student education (Anderson, 2009; Robertson, 2011; United States Department of Education, 2017; Robertson, 2011). Effective schools are a necessity for creating a healthy, prosperous culture that has a good economy, supportive and evolved citizens, and a competitive edge in global society. Effective use of technology can assist schools in becoming effective.

Determining teachers' perceptions of the effectiveness of professional development as it relates to integrating technology into the classroom in school districts similar to my home school district was beneficial for the purpose of meeting the needs of teachers as they work to prepare our students for college and careers. School district administrators are responsible for selecting and financially supporting professional development for the school staff, but educators should have influence on the type of professional development made available to them. Depending upon the demographics of the school district, the format of professional development may differ in regard to the teachers' highest degree level, years in education, and self-assessed technology usage level. The results of this study offer data that reveals teachers' perceptions regarding the effectiveness of professional development in the area of technology implementation in the classroom. This study was completed to determine the baseline for teachers' perception in New Jersey of the effectiveness of professional development as related to the integration of technology into the classroom and if it would be different based on the makeup of the staff.

Demographics considered were educators with different levels of technology usage, degree levels earned, and years of experience in education, however there was no statistically significant difference in the results based on the variates. The results of this data inform decision-making regarding integration of technology and methods of professional development intended to assist educators with integrating technology into the curriculum and the everyday classroom. Thus, the results of this study may help school districts to address challenges related to technology.

Recommendations for Further Research

Recommendations for further research include developing and testing a more in-depth survey to obtain specific data regarding specific formats of professional development. This researcher did not investigate every format of professional development for technology; nor were particular training methods from specific vendors evaluated. Creating a study with a pre-survey, a variety of technological professional development trainings, and an evaluative post-survey could offer greater insight; however, the expense would be extensive. Expanding the area from which the respondents are located could offer greater insight allowing for greater generalizability of the findings. This researcher would like to also investigate the use of professional learning communities to offer support and training in technological professional development.

Conclusion

With the enactment of new legislation in New Jersey requiring that teachers receive effective professional development to enable them to integrate technology into the classroom, ensuring students are provided with the skills and ability to compete at the global level, focus on professional development for teachers has increased (New Jersey Assembly, 2015, para. 1). Standards based accountability for both teachers and students are a national concern as a result of the development of content and performance based standards for students, standardized

assessments of those standards, and the outcomes of these assessments are affecting teacher evaluations (Achieve 2013; Dede, 2014). Students must be prepared to live and work in an increasingly technological world and must have the ability to use technology to function effectively (Achieve, 2013; ACT, 2008; Dede, 2014; Gorlewski, 2013; Kee et al., 2012; National High School Center, 2011). Educators effectively teaching technology and digital literacy is vital to the maintenance and growth of our nation's economic and technical competitiveness and to maintaining our status in the global marketplace (Gorlewski, 2013). A disparity exists between the format of professional development that districts focus on and the type that teachers believe is helpful (Boston Consulting Group, 2014). There is a clear need for quality, effective, ongoing professional development related to the integration of technology into the classroom that is provided in a format that educators prefer.

The areas studied included the perceptions of teachers regarding professional development related to the integration of technology into the classroom and the extent to which there may be statistically significant differences among teachers grouped according to years of experience and highest degree levels earned. The data showed that there is a statistically significant difference among teachers grouped according to years employed in an education field and their perceptions regarding professional development as related to the integration of technology into the classroom. The data suggested there was no statistically significant difference among teachers based on their perceptions and their highest degree level earned. Additionally, a statistically significant relationship was found to exist between the self-assessed technology level of teachers and their perceptions regarding professional development as related to the integration of technology into the classroom.

Insights gained through this study provide educational leaders with quantitative data regarding teachers' perceptions of professional development related to the integration of technology into the classroom and the related demographic areas. The findings from this study could prove helpful in developing talking points among educational leaders that may assist with the selection of trainings, workshops, and opportunities that are more beneficial to the general makeup of their staff to build upon their current knowledge base with ongoing, effective, reflective professional development. School district administrators need data to drive decision making regarding best practices for professional development for teachers.

The results of this study may offer administrators the data necessary to assist in the evaluation of staff needs to select a format of professional development that is appropriate for the needs of the educational staff. Teachers must be partners in the selection of professional development if the training is to be successful and meaningful to the educators. When educators are able to select the format of professional development that is most effective for their needs, the professional development provides the most benefit for the teachers, and, in turn, for the students. Ongoing, effective professional development is key to a successful learning environment for all the stakeholders in the educational process.

The main goal of this study was to explore a sample of teachers' perceptions of the effectiveness of professional development that addresses the successful integration of technology into the classroom. This study illustrates the perceptions of teachers regarding the current technology usage level serving to evaluate the current level of teacher perceptions concerning professional development training in technology perhaps as the basis for planned improvements for technology education in the state of New Jersey. The results of this study may help lay the ground work for the task force legislated by the state of New Jersey to study professional

development as related to the integration of technology into the classroom. There was no prior research available gauging the current level of teachers' perceptions of professional development in New Jersey prior to the introduction of the legislation to improve professional development.

This study was completed to determine the baseline of New Jersey teachers' perceptions of the effectiveness of professional development as related to the integration of technology into the classroom and if it would be different based on the demographics of the staff. Educators with varying levels of technology usage, degree levels earned, or years of experience in education do not perceive the effectiveness of professional development differently. This objective was accomplished, and the synthesis of the findings of this study demonstrate the need for an improvement in the form of additional extended, effective assistance, practice, and training for teachers in using technology in the classroom. The results of this study may assist school district administrators in improving professional development opportunities in the use of technology to enhance the integration of technology into the classroom to improve the learning in the classroom and to potentially raise the proficiency levels of students as they grow and develop to become young adults who are college and career ready.

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Appendix A: Figures

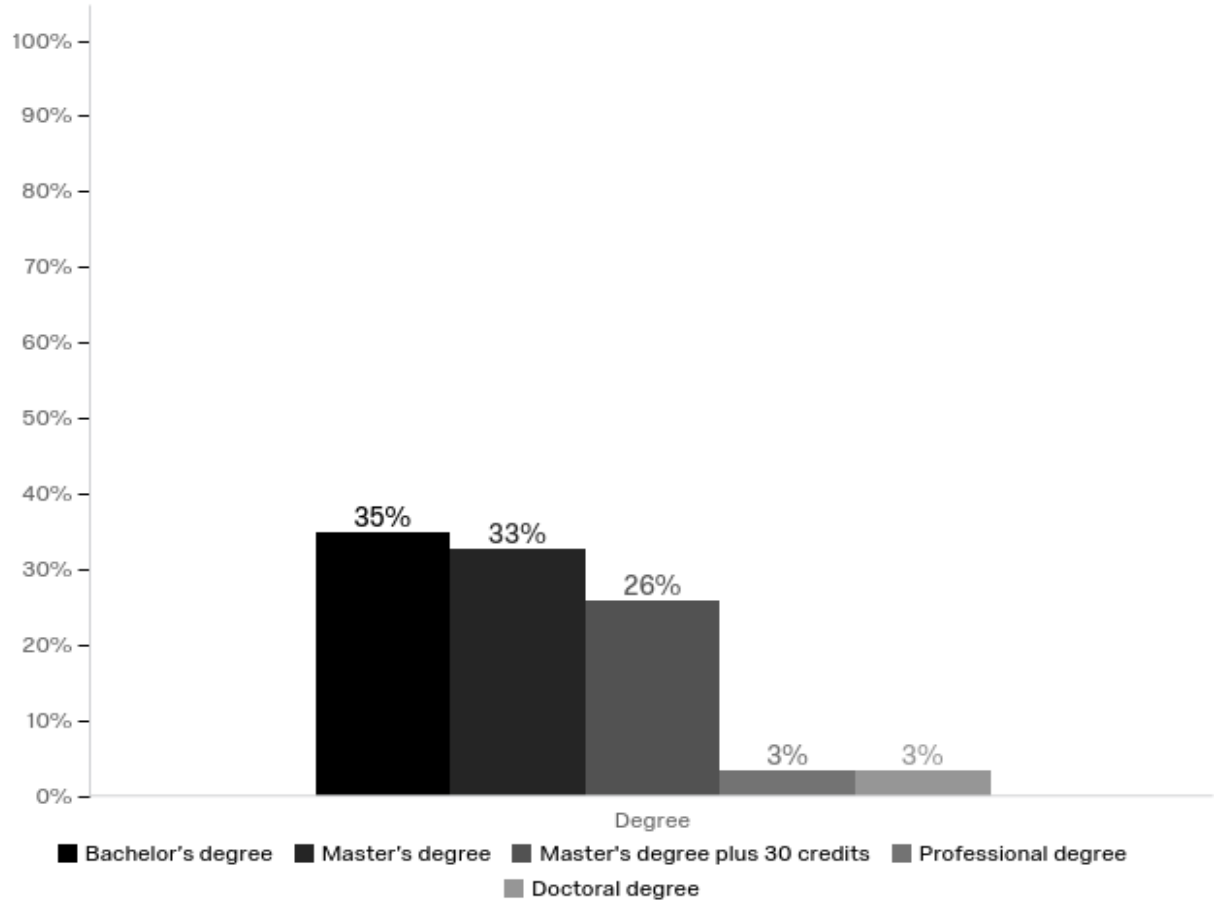

Figure 1. Respondent percentages of highest degree level earned.

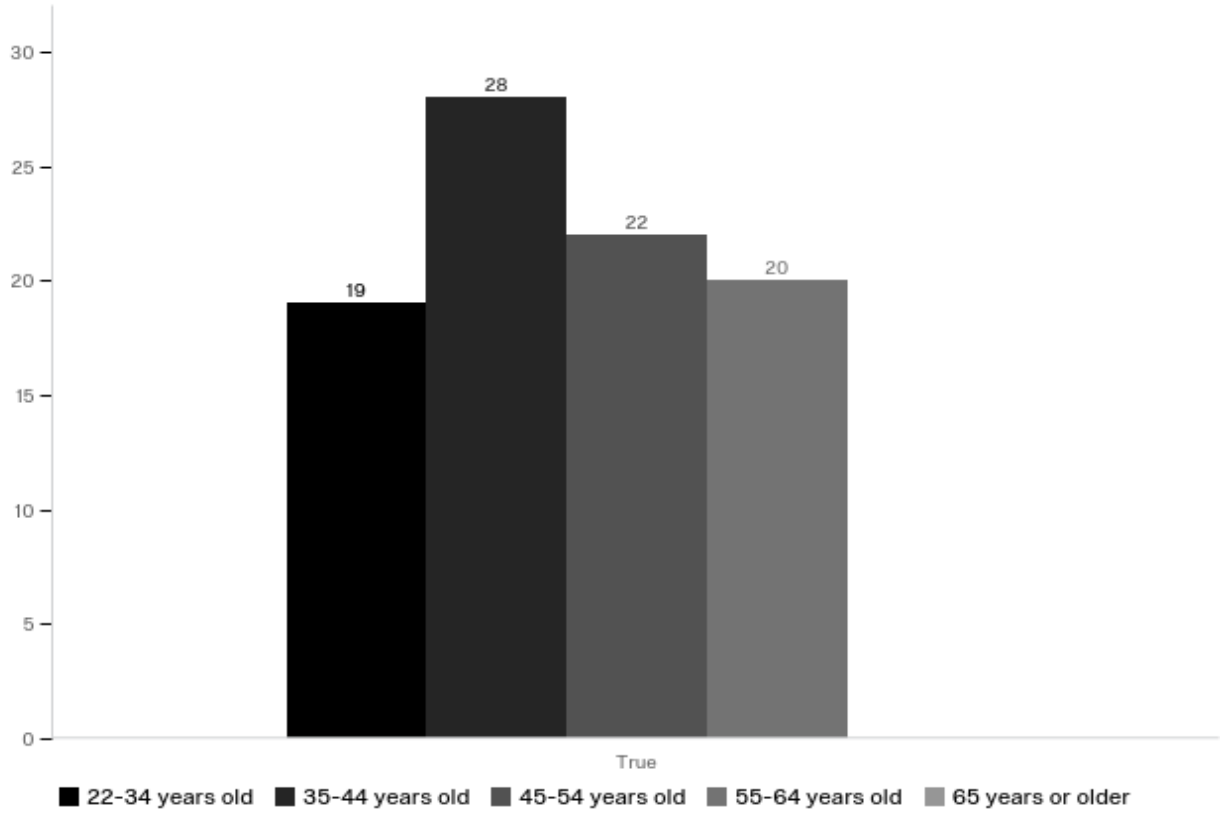

Figure 2. Respondent age grouping by count

Appendix B: Statement of Original Work

The Concordia University Doctorate of Education Program is a collaborative community of scholar-practitioners, who seek to transform society by pursuing ethically-informed, rigorously researched, inquiry-based projects that benefit professional, institutional, and local educational contexts. Each member of the community affirms throughout their program of study, adherence to the principles and standards outlined in the Concordia University Academic Integrity Policy.

This policy states the following:

Statement of academic integrity.

As a member of the Concordia University community, I will neither engage in fraudulent or unauthorized behaviors in the presentation and completion of my work, nor will I provide unauthorized assistance to others.

Explanations:

What does "fraudulent" mean?

"Fraudulent" work is any material submitted for evaluation that is falsely or improperly presented as one's own. This includes, but is not limited to texts, graphics and other multi-media files appropriated from any source, including another individual, that are intentionally presented as all or part of a candidate's final work without full and complete documentation.

What is "unauthorized" assistance?

"Unauthorized assistance" refers to any support candidates solicit in the completion of their work, that has not been either explicitly specified as appropriate by the instructor, or any assistance that is understood in the class context as inappropriate. This can include, but is not limited to:

Use of unauthorized notes or another's work during an online test

Use of unauthorized notes or personal assistance in an online exam setting

Inappropriate collaboration in preparation and/or completion of a project

Unauthorized solicitation of professional resources for the completion of the work.

Statement of Original Work

I attest that:

1. I have read, understood, and complied with all aspects of the Concordia University- Portland Academic Integrity Policy during the development and writing of this dissertation.
2. Where information and/or materials from outside sources has been used in the production of this dissertation, all information and/or materials from outside sources has been properly referenced and all permissions required for use of the information and/or materials have been obtained, in accordance with research standards outlined in the *Publication Manual of The American Psychological Association*

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