SECONDARY TEACHERS’ PERCEPTIONS AND SELF-EFFICACY REGARDING TECHNOLOGY INTEGRATION: A PHENOMENOLOGICAL STUDY

by

Christopher Loyd Brantley

Liberty University

A Dissertation Presented in Partial Fulfillment Of the Requirements for the Degree

Doctor of Education

Liberty University

2017
SECONDARY TEACHERS’ PERCEPTIONS AND SELF-EFFICACY REGARDING TECHNOLOGY INTEGRATION: A PHENOMENOLOGICAL STUDY

by Christopher Loyd Brantley

A Dissertation Presented in Partial Fulfillment Of the Requirements for the Degree Doctor of Education

Liberty University, Lynchburg, VA

2017

APPROVED BY:

L. Daniele Bradshaw, Ph.D., Committee Chair

Kristen K. Ascencao, Ed.D., Committee Member

Christopher M. Dunning, Ed.D., Committee Member
ABSTRACT

The purpose of this phenomenological study was to examine how teachers from various levels of technology self-efficacy perceive and implement technology within their specific classroom. Using a qualitative approach, I explored four public schools from a medium to large-sized school district in the Southeastern United States. The Technology Integration Confidence Scale (TICS) was used to purposively select 10 secondary teachers from the west side of Beach County (a pseudonym). The secondary teachers were placed into three groups based upon their individual self-efficacy level towards technology integration: (a) low, (b) average, and (c) high. Data was collected through the following methods: (a) TICS questionnaire, (b) face-to-face interviews, (c) classroom observations, and (d) focus groups. Social cognitive theory and activity theory were used as the theoretical framework. The data was analyzed using the seven steps as prescribed by Moustakas (1994): (a) bracket my personal knowledge, (b) record all relevant statements, (c) list non-repetitive/non-overlapping statements, (d) develop meaning units, (e) synthesize themes, (f) reflect and construct a description, and (g) construct a composite description of the lived experiences. Using this framework, five distinct themes emerged: (a) perceived integrated environment, (b) criteria for selection, (c) professional development, (d) integration barriers, and (e) reflective observations. The findings of this study will impact two main stakeholders: (a) the district leadership, whereas the district must provide adequate availability as well as a comprehensive districtwide technology use plan and (b) the classroom teachers, whereas they need to make a commitment to learn as well as use the technology.

Keywords: classroom technology, secondary teacher, social cognitive theory (SCT), teacher self-confidence level, technology integration, technology self-efficacy level
Dedication

I would like to dedicate this project to my immediate family who have supported as well as put up with my strange study habits over the last few years as I worked on this project. To my wife, Linda, thank you for the extra cup of coffee and the sandwich that kept me going in the early morning hours. Most of all, thank you for the many silent drives to work as I read page after page and typed on my computer. Linda, I am truly grateful for your love, support, and faithfulness that you have given me during my quest to expand my knowledge and understanding within the education community and the pursuit of this advanced degree.
Acknowledgments

I would like to acknowledge the following people who had a role in the completion of my dissertation. Without your encouragement, guidance, and support, I could not have finished this project. With my sincere appreciation and gratitude, I would like to thank you for your contributions to my success:

Linda Brantley
Morgan Brantley
Jared Brantley
Maria Williamson
Rachel Rice
Natalie Krause
Robert Aguis
Pastor Joan Holden
Pastor Paul Bradford
Dr. L. Daniele Bradshaw
Dr. Chris Dunning
Dr. Kristen Ascencio
Dr. Russell Yocum
Dr. Billie Jean Holubz
Dr. Scott Watson
Activity Theory ................................................................. 34
Self-Efficacy ................................................................. 34
Related Literature ............................................................... 35
Teacher-Centered Classrooms ........................................ 36
Technological Transformation ........................................ 38
Student-Centered Classrooms ......................................... 45
Barriers to Technology Integration .................................. 46
Teacher Beliefs ............................................................... 54
Teacher Self-Efficacy ........................................................ 55
Student Engagement ....................................................... 56
Additional Challenges ....................................................... 57
Summary .......................................................................... 59

CHAPTER THREE: METHODS ......................................................... 63
Overview ........................................................................... 63
Design ............................................................................. 63
Research Questions ........................................................ 64
Setting ............................................................................ 64
Participants ........................................................................ 65
Procedures ......................................................................... 67
Pilot Study ......................................................................... 68
Formal Study .................................................................... 69
Researcher’s Role ............................................................. 70
Data Collection ................................................................... 71
<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surveys/Questionnaires</td>
<td>72</td>
</tr>
<tr>
<td>Interviews</td>
<td>74</td>
</tr>
<tr>
<td>Observations</td>
<td>77</td>
</tr>
<tr>
<td>Focus Groups</td>
<td>79</td>
</tr>
<tr>
<td>Data Analysis</td>
<td>81</td>
</tr>
<tr>
<td>Trustworthiness</td>
<td>84</td>
</tr>
<tr>
<td>Credibility</td>
<td>84</td>
</tr>
<tr>
<td>Dependability</td>
<td>85</td>
</tr>
<tr>
<td>Confirmability</td>
<td>85</td>
</tr>
<tr>
<td>Transferability</td>
<td>86</td>
</tr>
<tr>
<td>Ethical Considerations</td>
<td>87</td>
</tr>
<tr>
<td>Summary</td>
<td>88</td>
</tr>
<tr>
<td>CHAPTER FOUR: FINDINGS</td>
<td>90</td>
</tr>
<tr>
<td>Overview</td>
<td>90</td>
</tr>
<tr>
<td>Participants</td>
<td>91</td>
</tr>
<tr>
<td>Stacy</td>
<td>91</td>
</tr>
<tr>
<td>William</td>
<td>92</td>
</tr>
<tr>
<td>Linda</td>
<td>93</td>
</tr>
<tr>
<td>Joseph</td>
<td>95</td>
</tr>
<tr>
<td>Terrence</td>
<td>95</td>
</tr>
<tr>
<td>Barbara</td>
<td>96</td>
</tr>
<tr>
<td>Clara</td>
<td>97</td>
</tr>
<tr>
<td>Jessica</td>
<td>98</td>
</tr>
</tbody>
</table>
SECTION A: OVERVIEW

1. Introduction

2. Literature Review

3. Methodology

4. Results

5. Discussion

6. Conclusion

REFERENCES

APPENDIX A

APPENDIX B

APPENDIX C
List of Tables

Table 1: Participant Demographics: Formal Study – Low Confidence Score .........................94
Table 2: Participant Demographics: Formal Study – Average Confidence Score ......................98
Table 3: Participant Demographics: Formal Study – High Confidence Score .........................101
Table 4: Repeated Words and Phrases Mentioned by Participants ............................................103
Table 5: Perceived Environment: Sub-themes by Participant ..................................................105
Table 6: Rationale for Use: Sub-themes by Participant .............................................................113
Table 7: Expansion of Personal Knowledge: Sub-themes by Participant .................................118
Table 8: Barriers Faced: Sub-themes by Participant .................................................................123
List of Abbreviations

Activity Theory (AT)
Bring Your Own Device (BYOD)
Exceptional Student Education (ESE)
Global Positioning Service (GPS)
Information and Communications Technologies (ICT)
Institutional Review Board (IRB)
Northwest Educational Technology Consortium (NETC)
Observation Protocol for Technology Integration in the Classroom (OPTIC)
Personal Digital Assistant (PDA)
Professional Learning Community (PLC)
Science, Technology, Engineering, and Mathematics (STEM)
Social Cognitive Theory (SCT)
Technology Integration Confidence Scale (TICS)
CHAPTER ONE: INTRODUCTION

Overview

Over the past 45 years, society has seen an enormous amount of growth in the development and use of technology (Tamim, Bernard, Borokhovski, Abrami, & Schmid, 2011). People from every sector of society have become captivated by what technology offers as well as what it can do. As technology evolves and becomes more widely adopted, its influence transforms how the members of society communicate and interact (Keengwe & Onchwari, 2011). Information that was difficult to obtain just a decade ago is now available from a few taps on the keyboard and a quick Google search. Through this advancement, daily lives have become more intertwined with technology’s ease of use and range of opportunities. In today’s world, people can either choose to become Internet savvy and get plugged into the network or struggle to make connections as they only stay loosely linked to the digital world by whatever basic means possible (Keengwe & Onchwari, 2011).

Today, almost any student within the K-12 secondary school environment can be observed walking through the halls with some form of electronic device. Device ear buds can easily be spotted extending out of their shirt collars while their eyes remain completely focused on the device’s small screen. These students are totally plugged into a virtual world that can only be imagined since it is very difficult to envision without a screen (Courts & Tucker, 2012). In addition, these types of students are far more likely to try new programs and applications because they have grown up with them in the digital age. None of these students know what it was actually like before the now uninterrupted, standard 24-hour access to the Internet. Although some schools are adjusting to this change in the environment by instituting a Bring Your Own Device (BYOD) to school program, many teachers still have the students turn off...
their devices before taking a seat in the classroom.

Even though this is a simplified example, it illustrates the technology gap that exists between today’s teachers and students. In order to bridge this technology gap and maintain a connection with these Internet wizards, teachers must join them within their particular environment (Courts & Tucker, 2012). Although easy to state, the task is monumental for most of those teachers born 30-plus years ago, since they grew up without the constant connection to the Internet. Essentially, teachers must have the confidence level to meet the students on their turf or they will become a roadblock standing in the way of the student learning process. Ultimately, the fundamental matter now becomes how does the pre-Internet teacher generation acquire the skills and confidence necessary to maintain the technological connection needed to help the digitally occupied student succeed? In addition, what are particular factors that influence the technology decisions made by the pre-Internet teacher generation in regard to their individual technology self-efficacy level?

Background

Since the early days of Plato and Socrates, educating students has been viewed as a more individual task, involving the transfer of knowledge from an instructor to the student. Bonk (2009) stated that although traditional teaching has been in a state of transformation, it has not really changed much over the last decade, even with the incorporation of new technologies. Many classrooms still remain teacher-centered even though there is a concerted effort within segments of the society to shift to a more student-centered approach (An & Reigeluth, 2011).

In today’s learning environment, teachers are no longer visualized as “the central figure, ‘the sage on the stage,’ the one who has the knowledge and transmits that knowledge to the students” (King, 1993, p. 30). Modern teachers are now seen as “a ‘guide on the side,’
facilitating learning in less directive ways” (King, 1993, p. 31). According to King (1993),
the professor is still responsible for presenting the course material, but he or she presents
the material in ways that make the students do something with the information—interact
with it—manipulate the ideas and relate them to what they already know. (p. 30)

This perception places the teacher in a very different role when compared to the more traditional
one established over the last century (King, 1993). Instead of lectures and rote memorization,
many teachers are challenging the students through technology-enhanced, problem-solving
activities (Courts & Tucker, 2012; Cullen & Greene, 2011).

As technology becomes more infused into the modern K-12 classrooms, teachers must
not only keep pace with the students’ technological abilities, they must improve their technology
skills and become more familiar with their applications. Instructors are encouraged to become
mentors, by helping students learn through the multiple types of technology integrated into the
classroom (Higgins & Spitulnik, 2008). The new paradigm shift involving the integration of
technology in the classroom has brought forth many interesting issues about learning within
today’s educational settings. These key issues are seen as determining the most effective means
of technology integration that can: (a) transform a traditional classroom into a student-focused
learning environment, (b) help teachers effectively use technology utilization to provide
scaffolding throughout the educational process as students move from one level to the next, (c)
help teachers innovate and enhance their teaching ability, and (d) help in the development and
building of the sense of community throughout the K-12 school setting. All of these are
legitimate issues that need to be addressed, especially when one is considering the incorporation
of technology within a modern K-12 school environment.

Every teacher enters the classroom with pre-existing perceptions toward technology
integration grounded on their past personal experiences. Experienced teachers who grew up in the pre-Internet era often find it harder to embrace the latest technological trends (Gray, Thomas, & Lewis, 2010). Many older teachers feel naïve or self-conscious when trying to use the same technology that students use every day (Mueller, Wood, Willoughby, Ross, & Specht, 2008). Then again, many new pre-service teachers say they feel very comfortable with the latest technologies, even though they have not taught or implemented any technology within the classroom (Cullen & Greene, 2011). What transpires is that there are multitudes of teachers stuck at opposite ends of the spectrum, which affect how technology is introduced and used within the classroom. Kim, Kim, Lee, Spector, and DeMeester (2013) found that individual perceptions about learning and teaching were related to personal integration practices. The teachers who held a higher level of self-efficacy were often more comfortable as well as more successful in their integration efforts (Kim et al., 2013; Mueller et al., 2008).

An and Reigeluth (2011) found that many teachers understand that when technology is used within the classroom, it is both important and beneficial for the students. In fact, most teachers believed that it was part of their job to use technology for student-centered learning (An & Reigeluth, 2011). Furthermore, Ertmer, Ottenbreit-Leftwich, Sadik, Sendurur, and Sendurur (2012) found that once teachers sensed the alignment between curriculum and technology, student learning increased. Even though some studies have found that a few teachers openly embrace technology within the classroom, most identified the teacher’s self-confidence level as the most influential factor for not using it (Cullen & Greene, 2011; Mueller et al., 2008). Although teacher intent to use technology remains high in respect to the classroom, the perception of the one’s skills and self-efficacy possessed for effective use remains rather low (Cullen & Greene, 2011; Wozney, Venkatesh, & Abrami, 2006). This notion is why an
individual’s perception of their technology self-efficacy is one of the most important factors within the decision-making process of using technology in the classroom (Kim et al., 2013).

Since technology is constantly evolving, many of the devices and programs grow old before a teacher masters their use. This can easily affect one’s confidence level and prevent the technology use before it gets into the classroom. In order to resolve this problem, training programs must be aimed at the teacher’s level of confidence, since hands-on practice reinforces the skills modeled during the training sessions (Hsu & Sharma, 2008). In other words, the fastest way for a teacher to obtain a higher level of technology self-efficacy is to learn through example and practice, since more opportunities to use often lead to higher comfort levels (Kim et al., 2013; Mueller et al., 2008). In addition, teachers also seem to be more successful if they practice what they learned within a support group, since sharing successes as well as ways to overcome the difficulties faced can be beneficial for all of those involved throughout the technology implementation process (Mueller et al., 2008).

**Situation to Self**

According to Kim et al. (2013), individual self-efficacy is vital to one’s implementation of any technological integration activity. It could be that older, more experienced teachers are afraid to look uneducated in front of the students. In addition, while most technical applications and programs have advanced tremendously in the ease of use and scope of opportunities over the last decade, many teachers do not use them consistently within their instruction or secondary classroom as a way to engage students. It could be that there are other, more influential factors as to the lack of integration besides the most common barriers of cost, support, and training. These questions, as well as my current job position, have brought about a tremendous curiosity regarding why technology is not used more often within a classroom to engage students. As a
classroom teacher, I continually seek out ways to connect to the students on their level. I am not afraid to use new applications within the classroom or seek help from someone with more knowledge, including students. Giving the students the opportunity to display their knowledge in real-life situations is not only important, it is vital to building strong relationships with them (Ertmer et al., 2012). I want to be able to help and support anyone, including students, who are willing to make the jump into the new technology-enhanced classrooms of tomorrow.

**Problem Statement**

The problem of focus in this study is to develop an understanding of teachers’ perceptions as well as how these beliefs impact technology integration within the secondary classroom with regards to their individual technology self-efficacy level. In a recent report issued by the Alliance for Excellent Education, Schwartzbeck and Wolf (2012) pointed out that a digital divide exists between the teachers and students in the understanding of today’s evolving technology in learning. In addition, secondary teachers’ perceptions about technology integration also differ on the application of these resources in the secondary classroom (Chen, 2008). Most veteran teachers grew up in a pre-Internet era, which did not utilize technology integration as the premier teaching and learning tool. Without this ability, experienced teachers find it difficult to benefit from the use of technology within the classroom environment (Gray et al., 2010). Although most instructors agree on the practicality of technology in the secondary classroom, many do not use it regularly (Chen, 2008).

The National Center for Education Statistics released a report in 2010 that drives home the point in which technology is readily available but seldom used in many school settings (Gray et al., 2010). According to Gray et al. (2010), “97 percent of teachers had one or more computers located in the classroom everyday” (p. 3). The report also expressed that “Internet
access was available for 93 percent of the computers located in the classroom every day and for 96 percent of the computers that could be brought into the classroom” (Gray et al., 2010, p. 3). In addition, Gray et al. (2010) indicated that “teachers reported that they or their students used computers in the classroom during instructional time often (40 percent) and sometimes (29 percent)” (p. 3). Furthermore, Gray et al. (2010) pointed out “teachers reported that they or their students used computers in other locations in the school during instructional time often (29 percent) or sometimes (43 percent)” (p. 3). The underutilization trend is startling since most teachers have or have access to computers that can be used for instructional purposes (Gray et al., 2010). Even though most teachers acknowledge that technology integration helps student achievement, many do not widely utilize it in their instruction or classroom to the students’ advantage (Chen, 2008). Therefore, by focusing on the teachers’ perspective as well as their individual technology self-efficacy level, research can be done to develop a better foundational base, whereas teachers, schools, and school districts can better understand, integrate, and utilize technology more appropriately for student gain. Overall, the problem is to gain a better understanding of secondary teachers’ perceptions of technology integration regarding their individual technology self-efficacy level as it impacts their classroom integration decisions.

**Purpose Statement**

The purpose of this phenomenological study was to examine how teachers from various levels of technology self-efficacy perceive and implement technology within their secondary classroom. Teacher perceptions and the technology implementation methods investigated were defined as the individual views and uses of technology within each secondary teacher’s classroom. In addition, the level of individual technology self-efficacy were defined as the individual’s overall technological confidence level score as defined by the Technology
Integration Confidence Scale (TICS). Through the understanding of individual perceptions and implementation methods, a better course of action can be established so the development of future professional instruction can be designed for one’s specific technology self-efficacy level. This approach will allow for the more efficient use of the limited professional development resources that are available throughout most school districts.

**Significance of the Study**

This phenomenological study is significant to the educational community since it sought to investigate and develop a better understanding of technology integration from a classroom teacher’s point of view. Each teacher brings a defined worldview with them to the classroom, which is comprised of personal beliefs and individual perspectives as well as lessons learned from their own specific experiences (Cullen & Greene, 2011; Gorder, 2008; Inan & Lowther, 2010a; Mueller et al., 2008). These concepts are essential to understand since classroom teachers are the ones who are actually implementing and using today’s technology with the students. Inan and Lowther (2010a) indicated that teacher readiness and teacher beliefs are influenced by computer proficiency, years of teaching, age, technical support, and computer availability. This notion means that a teacher could have some strong underlying convictions toward technology integration based upon their individual technology self-efficacy level (Kao & Tsai, 2009). In other words, teachers who had higher levels of technology self-efficacy often integrate technology more frequently than those with lower levels of technology self-efficacy. In fact, Lee and Tsai (2010) indicated that “teacher anxiety can often reduce the success of such technological and pedagogical innovations” (p. 5). In addition, Ward and Parr (2010) also stated that “with sufficient use, teacher confidence will rise” (p. 121). Thus, it is very important to garner an understanding of the lived experiences of actual classroom teachers, since possessing
an in-depth knowledge of this phenomenon can lead to improved implementation methods as well as enhanced professional development courses (Kao & Tsai, 2009; Kim et al., 2013; Lee & Tsai, 2010). Therefore, this study will focus on the teachers’ perspective of technology integration based upon their respective individual levels of technology self-efficacy.

This phenomenological study will also be helpful in adding to the fundamental understanding of the stakeholders involved since the state, district, and local leaders have been working toward removing barriers to effective technology integration within the school environment (Chen, 2008; Wise & Rothman, 2010). Oncu, Delialioglu, and Brown (2008) pointed out that “teachers are an indispensable factor in every educational setting, thus their use of technology should be of great interest to educators, school personnel, and policymakers” (p. 44). This means that technology integration should be defined by those who actually use it in the classroom instead of the engineers in an off-site computer lab.

With this in mind, technology integration should become a priority for the state, district, and local leaders as they seek to craft a more flexible environment for their implementation efforts. In fact, Ward and Parr (2010) stated that “teachers should be given sufficient support and encouragement to enable them to take risks and experiment” (p. 121) with new technology. This means that the stakeholders must view the technology integration effort from a different vantage point in order to prevent a narrow-minded approach to the phenomenon being studied (Baytak, Tarman, & Ayas, 2011). In other words, stakeholders can learn from teacher decisions that are influenced by their individual beliefs and perceptions about technology integration within the classroom. Once an understanding is achieved, state and local leaders can focus on their efficient management of the resources and personnel required for effective technology integration in the secondary classroom.
Research Questions

In order to obtain a complete picture of technology integration in today’s classroom, one must first garner an in-depth understanding of the perceptions of those who are using technology within the secondary classroom. Since each teacher may have a different level of technology self-efficacy, it was important to note their specific definition of technology integration as well as the factors that influence their decisions when implementing technology within the secondary school environment. With this in mind, this study sought to investigate the following research questions:

**RQ1:** How do teachers define technology integration in today’s secondary classroom?

**RQ2:** How do teachers make decisions about the type of technology to use in their secondary classroom in regard to their level of technology self-efficacy?

**RQ3:** How does the teacher’s individual level of technology self-efficacy impact the application of technology used within the secondary classroom?

The first research question, how do teachers define technology integration in today’s secondary classroom, provides the baseline from which a comprehensive definition can be derived. By incorporating meanings obtained from the multiple levels of technology self-efficacy, the overall definition was broad in scope, yet defined in nature to the specific technology integrated within the secondary classrooms. Since Oncu et al. (2008) stated that teachers are crucial in the educational setting, it is vital to gain an understanding of technology integration from their unique point of view. Therefore, a straightforward definition of technology integration from the teacher’s perspective was formed from the lived experiences expressed during the interview process. In addition, the focus group sessions had the opportunity to discuss and expand the definition if needed.
The second research question, how do teachers make decisions about the type of technology to use in their secondary classroom in regard to their level of technology self-efficacy, focuses on the specific factors and reasons that impact decisions made about the technology used in the classroom. Since each teacher may have strengths and weaknesses in different areas of technology, it was important to examine what influenced their particular decisions. Mueller et al. (2008) pointed out that technology integration decisions are based on the individual teacher’s personal beliefs and perspectives as well as lessons learned from their own specific experiences (Cullen & Greene, 2011; Gorder, 2008; Inan & Lowther, 2010a). By identifying and understanding these factors, technical support and professional training can be designed to focus on the needs of the classroom teachers. These specific lived experiences were brought out in the face-to-face interviews and corroborated during the focus group sessions.

The third research question, how does the teacher’s individual level of technology self-efficacy impact the application of technology used within the secondary classroom, focuses on the individual teacher’s self-confidence level, and whether the variances within these levels impact the specific technologies used in the classroom. Inan and Lowther (2010a) pointed out teacher readiness and teacher beliefs are influenced by their computer proficiency. In addition, Kao and Tsai (2009) indicated that teachers who possess higher levels of technology self-efficacy often integrated technology more frequently than those who have lower levels of technology self-efficacy. This means that it is important to understand the differences in the various levels of teacher technology self-efficacy. With this in mind, technical support and training programs can be designed to meet the specific needs of the teacher since ample classroom use sometimes leads to more teacher confidence (Ward & Parr, 2010). The TICS questionnaire was used as a starting point for each participant’s technology self-efficacy level
Research Plan

This study was qualitative in nature and used a phenomenological approach as detailed by Moustakas (1994) since the study sought to: (a) describe the common meaning, (b) examine a specific phenomenon, (c) focus on related individuals, and (d) understand their lived experiences. This study employed the use of the TICS questionnaire to purposely select 10 to 15 participants who have used technology within the secondary classroom. The potential participant pool consisted of approximately 400 secondary teachers employed on the west side of Beach County. The questionnaire was used to segment the respondents of the questionnaire into three levels of technology self-efficacy: (a) low, (b) average, and (c) high.

The study also used face-to-face interviews, field observations, and focus groups to gather individual perceptions of technology integration because according to Schwandt (2007), a phenomenological study seeks to examine the everyday experience from the individual’s point of view. In addition, the data collection methods provided a way to gather in-depth lived experiences of the participants, which allowed for a synthesis of the descriptions obtained so the real essence of the phenomenon under study was put forth. The data analysis process followed Moustakas’s (1994) seven steps of data analysis (see Data Analysis). The method of study selected was correct since phenomenological studies seek to investigate what was experienced as well as how it was experienced by a related group of individuals (Creswell, 2013).

Delimitations and Limitations

This phenomenological study used secondary teachers selected from the west side of a medium to large-sized southern school district as participants. All participants were selected and
segmented into low, average, and high self-efficacy level groups. Three to four actual participants were chosen for each level used based upon their self-reported level of technology self-efficacy as scored on the TICS questionnaire. Since the technology available varied from school to school based on the design of the school, support from the administration, and level of use at various west side schools, each segmented level group was made up of participants from different schools. This particular district was selected due to its pledge to integrate technology throughout their K-12 learning environment. Currently, over 98% of the teachers have 24-hour access to a modern district-supplied computer, either from within their classroom or their home (Unnamed Superintendent, 2011). In addition, the district has made a strong commitment to increasing the technology available district wide as well as working toward the goal of having a one-to-one computer-to-student ratio.

Potential limitations arose due to the sample used for the study since participants were chosen based upon their self-reported technology confidence level. In addition, the participant’s technology experience may not be associated with the identical types of technology as well as the same levels of school support. Furthermore, the participants may not share the same background, age, level of education, or individual experience with technology outside their work site. With these factors in mind, the study may not be generalizable to other school districts that have different populations and teacher demographics since Schwandt (2007) defined generalization as the process of inferring from the observed to the unobserved.

Definitions

The following terms and definitions are pertinent to this study.

1. **Attitude** - An attitude is a psychological tendency that is expressed by evaluating a particular entity with some degree of favor or disfavor (Eagly & Chaiken, 2007).
2. **Belief** - A belief is a mental representation that influences the practice of a teacher if and only if the belief is active in cognition (Hutner & Markman, 2016).

3. **Perception** - Perception is the subject’s act of receiving data from the outer world (Uzunboylu & Ozdamli, 2011).

4. **Professional development** - Professional development is facilitated teaching and learning experiences that are transactional and designed to support the acquisition of professional knowledge, skills, and dispositions as well as the application of this knowledge in practice (Buysse, Winton, & Rous, 2009).

5. **Self-efficacy** - Self-efficacy is the belief in one’s capabilities to organize and execute the course of action required to produce given attainments (Miller, 2002).

6. **Teacher readiness** - Teacher readiness is a teacher’s perception of his or her capabilities and skills required to integrate technology into their classroom instruction (Inan & Lowther, 2010a).

7. **Technology integration** - Technology integration is the use of technology in a teacher’s regular teaching and curricular plans (Cullen & Greene, 2011).

8. **Technology self-efficacy** - Technology self-efficacy is the belief in one’s ability to successfully perform a technologically sophisticated new task (McDonald & Siegall, 1992).
Summary

The focus of this study was to gain a better understanding of how teacher’s perceptions and beliefs in regard to technology impact their personal integration efforts within their classroom. In addition, the researcher also sought to gain an understanding of how these integration perceptions differ due to a teacher’s level of technology self-efficacy.

With this in mind, this study investigated how teachers perceive and implement technology within their classroom. The study concentrated on teacher perceptions and the technology implementation methods used in regard to their level of technology self-efficacy as defined by the TICS questionnaire. In addition, the researcher sought to understand how individual perceptions and implementation methods are established so future professional instruction can be designed for one’s specific self-efficacy level. This approach could benefit all stakeholders since it could match the level of teacher self-efficacy to the appropriate level of professional training required.

According to Schwartzbeck and Wolf (2012), a gap exists between teachers and students in regard to their technological understanding which in turn causes some teachers to forgo its use in the classroom. Even though most teachers agree that technology benefits the students in the classroom, many do not use it regularly in their classroom activities (Chen, 2008). This trend is alarming since most school districts provide teachers with access to computers that can be utilized for instructional as well as administrative purposes (Gray et al., 2010). Since students are using personal technology outside school every day, it makes perfect sense to use the same technology in the classroom as an avenue to bridge the gap that exists. Implementing a technology that is familiar to them may pique their attention and provide a foundation on which a relationship can be built. Relationships between teachers and students are important because
these associations open the door to understanding by allowing a student to trust in the learning environment. Once everyone feels comfortable within the classroom, it is much easier to create enthusiasm for the subject matter. Therefore, research needs to be done so teachers, schools, and school districts can better understand and utilize technology more aptly for student engagement as well as student achievement.
CHAPTER TWO: LITERATURE REVIEW

Overview

Over the past decade, there have been many changes that have taken place within the educational environment. These changes have mainly taken place through budget cuts, school reforms, curriculum changes, and accountability measures. Budget cuts and school reforms have had the largest impact as they have unsettled the foundation from which the current educational system has been built upon over the past century (Delgado, Wardlow, McKnight, & O’Malley, 2015; Wise & Rothman, 2010). In addition, curriculum changes and accountability measures have now placed the evaluative focus in the learning environment squarely on the interaction between the teacher and student as well as to the learning outcomes that the collaboration has produced (Bush & Wise, 2010). Additionally, many educational stakeholders have now become more vocal within their respective influential levels as they push for more engaging learning environments that are infused with today’s modern technological advances.

Even though there have been tremendous technological advances throughout society over the past 10 years, the education sector still lags behind in the use and implementation of technology within the classroom (Bush & Wise, 2010; Delgado et al., 2015). Gray et al. (2010) acknowledged this point in a recent report from the National Center for Education Statistics, which stated that even though there is technology readily available in the school environment, it often goes unused in many classroom settings. In addition, Bonk (2009) stated that “what a time traveler would quickly discover is that in most cases teaching has not really changed since the days of Plato, even though the technologies for learning have progressed dramatically, especially during this past century” (p. 22). This is significant since there has been a dramatic increase in both the funding for and acquisition of technology aimed directly at increasing student
achievement as well as student engagement within the classroom. In addition, there is now enormous pressure on those in the technology implementation process to ensure that the chosen technology can be used effectively within the classroom setting by both the teacher and student.

Although there have been major funding shortfalls across the educational environment, technology integration remains a top priority for many school districts since today’s classrooms are filled with digitally connected students who are consumed with the latest forms of computer-related technology (Delgado et al., 2015; Gray et al., 2010). The vast majority of these students are so engrossed with listening to music, communicating with friends, and playing video games on their network-connected devices that they are often too bored or uninterested to take part in traditional classroom activities (Erickson, 2012). This means that today’s teachers are now being challenged to create classroom activities that are just as engaging as the student’s video games. Even though this opens a door of opportunity to make connections within the student’s environment, many veteran teachers are at a disadvantage since most are not as plugged into the network as their digitally connected students (Gray et al., 2010). This can force most veteran teachers to stay within their own comfort zone, which is an authoritative content expert teaching in a traditional classroom setting. This is significant since the technology gap between teachers and students is widening in regard to their individual understanding and usage of today’s technology (Bush & Wise, 2010; Delgado et al., 2015).

Since many of the recently implemented educational reforms identify the teacher as the most critical component of the learning process, a closer investigation is warranted into the teacher’s perceptions and beliefs in regard to the overall teaching and learning process. Teachers are now seen as the primary individual who makes contact with the student, and they are quickly becoming more accountable for what occurs in the classroom (Stumbo & McWalters, 2010).
The new accountability focal point in the learning process is being placed squarely on the
teacher’s shoulders since the engagement and outcomes between the student and teacher are
being heavily scrutinized whether the results are beneficial or not (Oncu et al., 2008). This
means that the teacher now plays a larger accountability role in what is learned as well as how it
is learned within the classroom. Thus, understanding why a specific decision was made as to the
teaching and learning method selected, technology integrated, or the learning activities used is
very important since student achievement is being linked to accountability measures, such as
future salary increases as well as continued employment (Conley & Glasman, 2008). In other
words, today’s teachers must build authentic relationships with their students within the students’
own technology-laden environment if they hope to make the links needed to advance overall
achievement levels (Bush & Wise, 2010; Delgado et al., 2015).

With this in mind, this chapter will provide the foundation for the theoretical framework
that will guide the study. In addition, the review of the literature will start at the beginning,
when technology was first introduced in the classroom. It will proceed forward to examine and
discuss the K-12 classroom as well as some highlights of the technology transformation that has
taken place. It will also identify some of the known obstacles that must be overcome so that
successful technology integration can be achieved in the classroom. Finally, it will explore the
teacher’s role and connection to the overall learning equation, where success is often seen only
from those who are very confident in their own ability to integrate technology into the classroom.

**Theoretical Framework**

The theoretical framework used for this study is grounded in the combination of both
social cognitive theory (SCT) and activity theory (AT) since both provide an understanding of
how an individual learns from the back and forth interactions taking place within their
surroundings. Many scholars such as Bandura (1977), Kaptelinin (2005), Nardi (1996), and Vygotsky (1978) believe that individuals actively construct their own knowledge of their surroundings by a process of building understandings through interactions between the objects and environment around them.

**Social Cognitive Theory**

Social cognitive theory (SCT) as put forth by Bandura (1977), stated that one can learn and construct knowledge from within three distinct influential elements: (a) personal, (b) behavioral, and (c) environmental (Miller, 2002). Bandura (1977) also stated that each inter-reliant element can be segmented into smaller elemental components for further investigation. Personal influences can be reduced into four parts: (a) self-efficacy, (b) motivation, (c) anxiety, and (d) experience, while behavioral influences can be divided into three areas: (a) cognitive strategies, (b) metacognitive strategies, and (c) feedback to others (Bandura, 1977). Environmental influences, which are more difficult to control in regard to the individual, can be separated as: (a) modeling, (b) achievement, and (c) feedback from others (Bandura, 1977; Bandura, 2007).

Even though each influential element can be seen as a separate entity, they each interact on and around each other as learning takes place. For example, the personal influential element acts on both the behavioral and the environmental influential elements while the behavioral and environmental forces act independently on the personal element as well as on each other (Miller, 2002). Bandura (1977) called this interactivity, the triadic reciprocal causation model, which means that each component influence works on the others independently and that the overall influential outcome is normally contingent upon the most persuasive force (Bandura, 1977). In other words, the more one practices and develops a specific strength, the more confident one
becomes in using it. Thus, most people tend to develop skills and strengths, which Bandura (1997) called self-efficacy, in the areas they are most comfortable with (Miller, 2002).

**Activity Theory**

On the other hand, activity theory (AT) as put forth by Vygotsky (1978) and later modified by Kaptelinin and Nardi (2012), stated that people construct knowledge through a collaborative process between the person, known as the actor, the interaction, known as the activity, and their encircling world, known as the object (Bakhurst, 2009; Kaptelinin & Nardi, 2012). The basic theory is comprised of the simple assumption that a person (the actor) learns from his or her interaction (the activity) between his or her self and the surrounding world (the object). In other words, people often build unique and personal understandings (self-efficacy) of life-based upon their experiences within their surrounding environments.

As people continue to experience growth, their interactions become more internalized, refined, and stored mentally for later use. Thus, confidence or individual self-efficacy is built through the continued efforts of developing one’s strengths as opposed to working with one’s weaknesses (Bakhurst, 2009). Even though SCT and AT have some differences, both share similarities in the fact that people tend to start and complete more activities that they are proficient in compared to ones in which they are not. Ultimately, one’s self-efficacy or confidence level in a given skill becomes very important, since one more often works on their personal strengths, staying in their comfort zone, while rarely venturing out into the unknown. It is for this particular reason that both learning theories are commonly used in the realm of modern human and computer interactive research (Kaptelinin & Nardi, 2012).

**Self-Efficacy**

The innate ability to be confident in specific skills and actions is very helpful when one is
placed in pressure-filled situations. As the teacher becomes more accountable for student learning taking place, stress develops, and fear and anxiety become commonplace. This brings to light two influential elements that are common in each theory, self-efficacy (confidence) and individual motivation (desire to achieve). Self-efficacy, also known as one’s confidence level, is the belief that one can control their own situations, such as being able to use their favorite skill sets in an effective and productive way (Miller, 2002). Individual motivation, seen as the internal commitment to succeed, fosters one’s ability to do more, even in the face of adversity (Miller, 2002). Thus, one’s practical experience becomes an integral part of how one learns and responds to the environment around them. Those who are more proficient in a particular skill set use the skill set more successfully and more often than those who are not. If self-efficacy and individual motivation are fashioned together in an effective and productive manner, anxiety can be reduced, and the amount of frustration is contingent upon one’s ability to successfully complete the task (Miller, 2002). Ultimately, having a higher level of self-confidence in any of these individual influential areas can change the outcome of the entire learning process (Lee & Tsai, 2010).

**Related Literature**

Over the last 45 years, technology integration has been viewed as the comparison between two competing classroom formats; one where technology is integrated into the curriculum and one where it is not (Tamim et al., 2011). Throughout this process, all eyes have been primarily focused on whether one set of students achieved more than the other. The very first study, completed during the 1960’s, involved the investigation of whether a computer could be used as a teaching device (Schurdak, 1967). The study compared three groups of students, each with a different learning treatment. The first group used the computer as an instructor,
while the second group used a planned text-based program on the computer. Meanwhile, the third group received classroom instruction from the teacher in the normal lecture-style format. At the end of the term, all students were assessed, and the results were analyzed.

Although the results indicated some promise, the individual group results were not irrefutable and led Schurdak (1967) to state that computer usage may only provide the possibility for increased student learning within the classroom. Even though Schurdak’s statement was simple in scope, his notion laid the foundation for the establishment of the technology integration movement as well as the study of its impact on the educational environment. Researchers quickly moved to introduce technology into the classrooms at every level as they studied how it influenced student engagement as well as increases to potential achievement levels.

**Teacher-Centered Classrooms**

Even though there was an increased effort to put more technology into the classroom, for the better part of the last century, classrooms have generally been based on a traditional, teacher-centered classroom model (Bonk, 2009; Delgado et al., 2015). In this setting, the teacher is considered the most important component, whereas they are recognized as the sole knowledge provider within the classroom. In addition, the teacher controls the entire learning environment, such as what is learned and when it is taught as well as how it is presented. This ideological mindset places the teacher in a very prominent position in regard to student learning. Within this particular setting, the instructor is perceived to be in absolute control, and everyone’s attention is directed to the information that is being presented (King, 1993).

The students, on the other hand, are just in attendance to absorb the material presented by the instructor. In this scenario, the students are seen as only passive learners, much like empty vessels that needed to be filled by someone who held supreme knowledge of the content (King,
1993). All instruction is selected, mapped out, and presented by the teacher. In addition, the students have little to no say in the curriculum provided or in the form it is delivered. Student achievement is primarily measured by summative tests, where students are often asked to recall facts and important examples of the material presented. Mastery of the material is only shown by those who achieve high test scores on the standardized summative assessments that are primarily based on student memorization and recall of significant facts presented by the teacher (King, 1993). Although this method is successful for some students, it is not viewed as the most successful approach to get the majority of the students thinking for themselves, since classroom control remains exclusively with the teacher.

Even though the traditional teaching model seems outdated to some, it still remains widely used across the learning environment, since many veteran teachers grew up within that particular classroom setting (Bonk, 2009). As these students became educated and replaced their previous teachers, they held tightly to the belief that classroom teachers were the main knowledge providers as well as the only ones in control (King, 1993). In their minds, the students were there basically to learn from them, much like the sage on a stage who provided knowledge and wisdom to those who followed him (King, 1993). As time passes and more technology is introduced into the classroom, this widely held viewpoint has begun to soften. Many teachers are now beginning to explore the use of new technology as well as the different ways to present and deliver classroom material (An & Reigleuth, 2011). While still being viewed as the classroom content expert, some teachers have begun to engage students in a more collaborative manner, such as using technology as a way to bridge the connection gap between teacher and student within the classroom. This change in instructional philosophy has led to a transformation within some of the traditional classrooms settings.
**Technological Transformation**

As technology evolved, more and more studies were conducted using a large variety of electronic devices. Some of the most commonly studied electronic devices were personal digital assistant devices (PDA), cell phones, smartphones, and laptop computers that connected the learning environment to the student while outside the classroom. Comparisons were mostly made between the traditional methods of providing instruction and the newly introduced device’s ability to possibly increase student achievement. More often than not, the studies showed continued use of the devices at the student level increased student engagement within the class (Carver, 2016; Huang, Lin, & Cheng, 2010; Vavoula, Sharples, Rudman, Meek, & Lonsdale, 2009). In addition, Downes and Bishop (2015) stated that “teachers and students made it clear that ready access to educational technology is a vital force for engagement, relevant to students’ lives, and inspiring for their teachers” (p. 12). Moreover, increased classroom involvement often led to increased student satisfaction as well as potential higher levels of individual student achievement (Courts & Tucker, 2012; Kim & Downey, 2016). With this in mind, most of the results supplied seemed to support the notion that the use of technology increased student engagement, which in turn, increased student learning.

**Personal digital assistant devices.** PDAs are small hand-held devices that can be used by an individual or group for the retrieval or storage of data. Reynolds, Walker, and Speight (2010) conducted a study using PDAs as a method of gathering and retrieving information during a museum trip that resulted in increased student engagement and overall achievement. The use of the PDAs allowed the students to receive real-time information updates about the various items and contents shown as the student entered and moved through the specific exhibits. The students were able to store information and then share it with others once they returned to the
classroom. This notion, in turn, led to an increase in the student satisfaction levels, since the student was able to learn on his or her own without direct involvement from the instructor (Reynolds et al., 2010). The increase in student satisfaction levels gave rise to higher classroom engagement levels as well as higher potential student achievement.

Likewise, Huang et al. (2010) used PDAs in an elementary science class as a means of studying plants. The students were able to use the PDAs to take pictures of unidentified plants and then compare them to the pictures of the ones contained in the preexisting database. This provided a quick reference point for accurate identification of the plant. In addition, the students were able to use the Global Positioning Service (GPS) function of the PDA as position locator, so they could accurately mark the location of their specific plant identification. Upon returning to the class, the students were able to share the plants identified and the pictures taken as well as the location where they were found (Huang et al., 2010). The integration of this technology led to increased student satisfaction and classroom engagement. The increases in student satisfaction and classroom engagement also provided the potential for higher levels of student achievement.

Podcasting. Podcasting is the use of digital media to create and store audio and videos files for later use. For example, a classroom lecture can be recorded and placed on the Internet for students to download, so when a class is missed, it can be used anytime for study purposes. As a way of attempting to increase student involvement, Vajoczki, Watt, Marquis, and Holshausen (2010) showed that the use of podcasting was successful in increasing student engagement and overall learning. In the study, students were able to access previous instructional lessons via an uploaded podcast whenever needed, such as after a missed class or before an upcoming test. Having the ability to review past lessons as well as ones recently given
by the instructor provided students with increased control over their learning, which contributed to an increase in their overall course satisfaction (Hew, 2009; Vajoczki et al., 2010). The increase in overall course satisfaction levels provided more student engagement as well as higher potential student achievement.

**Text messaging.** Text messaging is the process of communicating with one another by the use of sending and receiving short messages. Kovalik and Hosler (2010) conducted a study on the use of text messaging as a way of keeping students engaged while outside the classroom that showed increased engagement for those students who used the technology. In this study, students were provided with updated information about their course, such as assignment due dates, posted grades, and test reminders via text messages. The increased communication efforts lead to increased class involvement and more student accountability, which again showed increases in course satisfaction (Kovalik & Hosler, 2010). The increase in student satisfaction paved the way for increases in both student engagement and potential higher achievement levels.

**Smartphones.** In another example, Zhang et al. (2010) introduced the use of a smartphone as a mobile computing platform within the classroom environment. In the study, students from a primary school used the smartphone as a way to learn while they were both inside and outside of the classroom. The students used the smartphone as a personal learning tool as they took pictures, recorded audio and video files, and created and maintained documents that were related to the curriculum (Zhang et al., 2010). When given the opportunity, the students used their smartphones as a way to share and collaborate with their peers as they engaged in knowledge building activities. In addition, they were able to store and retrieve concept maps and text documents required for class discussions and student activities. The use of this technology gave the students the ability to learn on their own whether they were in class...
or at home (Zhang et al., 2010). The 24/7 learning capability helped to increase their classroom engagement as well as their overall course satisfaction level, which in turn, led to higher potential achievement levels.

**Technology-enriched environment.** A technology-enriched environment is one that is infused with technology so the material can be presented as well as interacted with by the entire class. Maninger (2006) used a technology-rich environment as a way to help ninth graders improve their scores on a state-mandated reading test. The technology-rich classroom environment was set up with a one-to-one ratio of computers to students. In addition, the classroom also had a multimedia projector, a digital camcorder, and related multimedia software that allowed the students to create and present multimedia projects. The comparison classes did not use any of the technology items within their normal course of study. Students in the technology-rich environments were encouraged to use the technology as a way to collaborate, discuss, and go in-depth on their reading topics (Maninger, 2006). This allowed the students to view and discuss topic ideas from several different points of view, which increased their content understanding as well as their classroom engagement levels. In addition, Maninger (2006) reported an increase in the students’ achievement level on the state-mandated reading test in comparison to the other courses that did not use the technology-rich environment. This shows that when students are interested and engaged within the classroom environment, they can also raise their level of achievement on summative designed tests. Again, the increased student engagement levels led to higher potential student achievement.

**iPads.** An iPad is a hand-held computing device that allows its user to connect to the Internet as well as use specially designed applications that interact with stored and retrieved data. Ward, Finley, Keil, and Clay (2013) used iPads as a way to integrate technology into several K-
12 science, technology, engineering, and mathematics (STEM) classes. The students used iPads for mathematical calculations, data generation, and for document storage and retrieval of information for classroom activities. The iPads allowed the students to connect to one another in a more personalized way (Ward et al., 2013). This enabled more collaborative interactions between the students, which led to more creative and in-depth projects. Since each student was given an iPad to use, they were able to model and represent the data in a more meaningful manner. This allowed the students to become more engaged in the regular classroom activities as well as their collaborative projects (Ward et al., 2013). Even though there have been many successful stories, Long, Liang, and Yu (2013) pointed out that the use of new technology often places additional pressure on those who use it. All in all, as the new technology was introduced at the student level, the students became more engaged, reported higher levels of satisfaction, and demonstrated higher levels of achievement.

**Computer laptops.** A computer laptop is the most common device that is found within today’s school environments. It has all the capabilities of a desktop computer, yet is mobile and can be moved from place to place. It allows the user to connect to the Internet as well as manipulate text and data within a word processing environment. Cavanaugh, Dawson, and Ritzhaupt (2011) conducted a study of computer laptop use within the classroom which also showed increased student engagement and relative higher overall achievement. In this study, students used laptop computers as a means of engaging in project-based, inquiry-oriented, and active learning assignments (Cavanaugh et al., 2011). The use of the computers allowed the students to learn on their own and in the manner they perceived as the most effective for them. Lowther, Inan, Ross, and Strahl (2012) also experienced similar results in their study as laptop use allowed students to achieve at the same or at higher levels than the control group. These
factors increased student satisfaction and engagement at the point of learning, which in turn, led to potentially higher levels of achievement. Once again, the results showed that increases in student satisfaction often led to upturns in student engagement as well as possible higher levels of achievement.

Although increased student achievement cannot be directly tied to the specific use of technology, student engagement increased in each setting that used technology as a method of increasing individual student involvement. In other words, as student engagement increases, students get more involved in their own learning process and thus, have a much better opportunity to retain more knowledge and succeed in the basic classroom setting (Cavanaugh et al., 2011; Kovalik & Hosler, 2010; Reynolds et al., 2010; Vajoczki et al., 2010). This is significant for classroom teachers since increased student involvement often sets the stage for increased engagement and possible increases in student achievement, which is the basic goal of the student learning process. To become more effective within today’s classroom setting means that teachers need to scrutinize how their decisions are made as to their attempts to increase engagement through the incorporation and use of modern technology.

Even though the educational setting has traditionally been viewed as a pioneer in the use of technology in the classroom, technology has not completely taken over the learning environment (Bush & Wise, 2010; Wise & Rothman, 2010). There are still lots of veteran teachers who do not use technology within their classroom instruction, and it seems as though one can always find a technology integration failure to match every success story. Thus, instructional success in the use of technology depends on many factors. According to Inan and Lowther (2010a), teachers were negatively impacted by their age and years of teaching experience, whereas many veteran teachers were less proficient in their computer skills and
technology integration efforts. This is a significant issue since Wise and Rothman (2010) reported that every state in America had at least 40% or more of their current teaching population at or above age 50. This places more pressure on the veteran teachers as they attempt to successfully integrate technology into their classroom. For many veteran teachers, it is much more likely that they will retire before they can fully adapt and change their method of teaching so they can integrate technology in an effective manner. With this in mind, it is easy to understand why the educational environment is still lagging behind the rest of society in the technology integration effort.

While each advance in technology has brought new ideas and improvements to the educational setting, the traditional learning environment has remained basically unchanged from the traditional face-to-face classroom design (Bonk, 2009). Most technologies are still used more for professional productivity and to facilitate and deliver instruction rather than to challenge and engage students (Delgado et al., 2015; Gorder, 2008). Recently, there has been an upward trend in the online teaching and distance-learning forums. The increase in popularity now has this area blossoming into the fastest-growing segment of the transforming educational landscape (Friedman, 2007). Students are now seeking alternative ways to learn, which are self-paced, self-guided, and more in tune to their individual learning situations. Traditional classroom settings are no longer the only option in today’s educational settings since there have been numerous efforts put forth to integrate technology throughout every level of the K-12 learning environment. It seems as though once a technology is released and integrated into society, no one can predict how it will change or affect the existing environment. Once the technology has been released and used, it continues to change until it is transformed into what society actually wants. Today’s classrooms are no different considering the traditional brick and
mortar buildings are now envisioned as dynamic learning environments where teachers and students meet to increase student knowledge and raise achievement levels. According to Tamim et al. (2011), “technology’s main strengths may lie in supporting students’ efforts to achieve rather than acting as a tool for delivering content” (p. 17).

**Student-Centered Classrooms**

Many of the most recent reform and technology integration efforts have been aimed at transforming the learning environment from the traditional teacher-centered classroom, known as the sage on the stage model, to the new modern student-centered setting known as the guide on the side model (King, 1993). Within the student-centered classroom, there are more opportunities for student-supported activities as well as self-directed learning (Bang & Luft, 2013; Buss, Wetzel, Foulger & Lindsey, 2015; Fu, 2013). In this setting, students are given more control over the material learned as well as the manner in which it is presented. This often provides alternative ways of assessment so students can easily demonstrate their mastery of it. Teachers act as guides on the side, helping the students as they construct knowledge from their own inquiries and collaborations with their instructors (King, 1993). Assessments are no longer just given at the end of unit since students are now formatively assessed as they progress throughout the curriculum. This provides the student with numerous opportunities to demonstrate mastery of the material.

Within this particular setting, according to Baytak et al. (2011), most students understood the value of technology use as well as the individual authority they were given over their learning process. Although students can benefit from this type of environment, it does take extra time and planning for teachers to set up and develop. This presents a challenge to veteran teachers since they must learn and incorporate new and differentiated instructional strategies to
their method of teaching. Even though today’s students are much more capable of handling the independence given in the student-centered classroom, collaborative activities that promote student engagement are often more time-consuming for the teacher to evaluate and assess (An & Reigeluth, 2011; Assan & Thomas, 2012; Chien, Wu, & Hsu, 2013).

Ultimately, it seems as though the trade-off is a decision that the teacher has to make since they must give up a portion of their classroom control in addition to providing extra support and guidance to the students in a more differentiated instructional manner. In some instances, veteran teachers consider this aspect to be extra work for no additional compensation, while others view it as just being part of the job. These beliefs can place teachers at opposite ends of the classroom spectrum, where veteran teachers choose the traditional manner of instruction as opposed to other teachers who select a more collaborative approach. Although the instructional transformation can take place without a genuine commitment and belief in the process from the individual teacher, the proposed changes are not guaranteed to take hold and supplant the traditional methods of teaching (Bang & Luft, 2013; Kim et al., 2013). In other words, the teacher is the main component within the technology integration equation upon which change must take place. This means that the individual teacher has a tremendous input into whether a particular technology is used. Therefore, it is important to gain a complete understanding of the underlying reasons behind the teacher’s decision as to why some technology is used and some are not.

**Barriers to Technology Integration**

Although each educational setting has its own unique challenges, technology-enhanced classrooms seem to have a common list of obstacles that must be overcome. For example, An and Reigeluth (2011) found that the 10 most commonly identified obstacles were: (a) lack of
technology, (b) lack of personal time, (c) assessment alignment, (d) administrative support, (e) lack of personal knowledge (teaching methods), (f) lack of personal knowledge (technology understanding), (g) lack of technical support, (h) personal beliefs and attitudes toward teaching methods, (i) personal beliefs and attitudes toward technology, and (j) school/subject culture. Although their identified lists are not as long, several other studies, such as Kim et al. (2013), Fu (2013), Oncu et al. (2008), and Mueller et al. (2008) concurred and are in agreement with most of the commonly identified barriers.

In order to gain a better understanding of these barriers, they must be commonly aligned and placed within descriptive categories to assess the impact and effect on the teacher within the K-12 environment. Most researchers place these barriers in three distinct categories such as: (a) administration controlled, (b) teacher controlled, and (c) those outside the local school’s authority. According to Fu (2013), the following identified barriers can be placed within the administration’s control category: (a) lack of technology, (b) administrative support, (c) lack of technical support, (d) school/subject culture, and (e) all professional trainings covering technological knowledge and teaching methods. Likewise, Kim et al. (2013) placed the following obstacles within the teacher’s control category: (a) lack of personal time, (b) lack of personal knowledge (teaching methods), (c) lack of personal knowledge (technology understanding), (d) personal beliefs and attitudes toward teaching methods, and (e) personal beliefs and attitudes toward technology. As for the last remaining obstacle, assessment alignment, An and Reigeluth (2011) placed it within the category that is outside the local school’s authority. Now that the commonly identified barriers are categorized, it is important to take a closer look at the barriers from within their respective category of control.

**Outside the local school’s authority.** Although very important in terms of educational
reform, assessment alignment remains outside the control of the local school’s administration and individual teachers (An & Reigeluth, 2011). This area has always been developed and implemented at the state level. First, the state identifies the standards of mastery for a given content area. Next, the state identifies the required skills and tasks that would show appropriate understanding or demonstrate mastery of that particular content area. At this point, the state would disseminate the standards, skills, and tasks to the school districts and teachers. Then, the districts, schools, and teachers would begin to present and teach the subject area content to the students over the course of the school year. Finally, near the end of the school year, the state would use a standardized summative test to assess the students’ mastery of the entire year’s curriculum. This is a high-stakes testing environment where student achievement can be used to evaluate the effectiveness of the teachers as well as the efficiency of the school (Conley & Glasman, 2008). Within this setting, there is often more focus placed on presenting material than integrating technology in the classroom.

Although there are now online versions of some textbooks as well as complementary websites to enhance classroom learning, many teachers tend to use what they know since student mastery is shown as a summative test score and a corresponding achievement level. When placed in a restrictive situation like this, most teachers move back to their comfort zone, which is often an authoritative content expert in a traditional classroom setting (Chien et al., 2013; Inan & Lowther, 2010b). This course of action will not help in the integration of technology or move the teacher closer to a more collaborative instructional approach within the classroom. Even though this barrier can be overcome, it needs support from multiple levels of authority. Since this is normally more than a regular teacher can give, it remains a formative barrier that is difficult to resolve without additional help from the entire learning community (An & Reigeluth,
2011; Assan & Thomas, 2012; Chien et al., 2013). With this in mind, it is also important to investigate and understand what the administration and individual teachers actually control.

**Administration controlled.** In most people’s view, it has always been the administration’s responsibility to build and develop the structural foundation for a school’s learning environment (Jones, 2017; Dolan, 2016; Oncu et al., 2008). This implies that the administration is responsible for providing the necessary and required materials for a productive learning setting such as an appropriate facility, equipment, and infrastructure. This also suggests that the administration is responsible for supplying and maintaining up-to-date technology in which the mandated curriculum can be delivered. In today’s learning environment, most school districts have an underlying information management system where attendance is documented, grades are entered, and regular correspondence takes place throughout the district. Although these types of management systems have similarities, many are customized to particular district needs, which means users have to be trained in order to use them effectively. This means the administration is responsible for the training of all technologies that are put into place. This barrier can be overcome by most administrations since some sort of initial training is normally required before users can access the school management system (Hineman, Boury, & Semich, 2015; Oncu et al., 2008).

In addition to the software management system, the administration is responsible for providing the necessary technological equipment that is approved for use within its information technology infrastructure (An & Reigeluth, 2011; Assan & Thomas, 2012; Buabeng-Andoh & Totimeh, 2012; Dolan, 2016). Most school districts accomplish this by providing a school computer so a teacher can use it to access the management system and deliver the appropriate curriculum to the students. Additionally, the administration is also responsible for obtaining and
supplying any other technology-related equipment that may be required such as handheld computing devices, student response systems, access to appropriate software applications, and school technology labs. Even though each school’s technological equipment may differ, the administration is still responsible for supplying the hardware as well as the necessary training for its appropriate use (Buabeng-Andoh & Totimeh, 2012; Dolan, 2016; Oncu et al., 2008). This barrier can be overcome by a proactive administration where the administration supplies the hardware and training needed as well as modeling its use within the school’s learning environment.

Modeling the use of technology is very important within the school setting since this practice makes it easier for others to recognize the value of the technology that is available for instructional use (An & Reigeluth, 2011; Clark, Zhang, & Strudler, 2015; Dolan, 2016; Howard & Thompson, 2016). Often times, teachers do not know what is actually available or how it can be used within their classroom. Without prior knowledge of the technology, many teachers tend to choose a wait and see approach, before using the technology within their classrooms (Heath, 2017; Howard & Thompson, 2016; Kim et al., 2013). This suggests that the instructional staff is closely watching the administration’s actions in regard to the use of technology. If the administration tells everyone to use a particular technology but does not use it for themselves, the technology often goes unused.

On the other hand, if the administration supports a technology and then uses it within the learning environment, it normally gains followers and is used more frequently within the classroom (Clark et al., 2015; Heath, 2017; Howard & Thompson, 2016; Oncu et al., 2008). This barrier can be overcome by a supportive administration, whereas the administration supplies the selected technology and then demonstrates the effectiveness of its use throughout the
school’s learning environment. This type of action tends to build a supportive school culture, which is vital to implementing a technology-enhanced school setting (An & Reigeluth, 2011; Assan & Thomas, 2012; Buabeng-Andoh & Totimeh, 2012; Clark et al., 2015; Heath, 2017).

The final administrative barrier, school/content culture, is not as easily overcome. This barrier requires a great deal of time as well as administrative support and commitment (An & Reigeluth, 2011; Assan & Thomas, 2012; Dolan, 2016). Cultural change can be difficult in any situation and may take a great deal of effort and time. In order to begin, the school must have a clearly defined vision as well as attainable goals that are underscored by a total and complete administrative commitment. Without consensus at the administrative level, suggestions of change often fall upon those who are not willing to take the lead. If new technology is introduced and not supported or modeled, the technology integration effort will probably struggle and fail before full implementation. Teachers need to believe in both the technology’s application and value before committing to the technology’s use (Carver, 2016; Clark et al., 2015; Dolan, 2016; Kim et al., 2013). A strong administrative commitment for the support, use, and training for the technology is always key since it allows the teachers to have some faith that their own commitment to the technology will be worth the extra effort (Hechter & Vermette, 2013; Howard & Thompson, 2016). Additionally, Ritzhaupt, Dawson, and Cavanaugh (2012) stated that the “educational organizations must facilitate progress through a strong focus on scaffolding teacher technology skill, support, and use with students” (p. 247). This barrier can be overcome by an encouraging administration whereas the administration models the change in culture as well as the use of the technology. In other words, teachers will embrace the introduction of innovative technologies that have perceived value as long as they believe in the administration’s commitment and continued support of it.
**Teacher controlled.** On the other hand, it is often reported that there is not enough extra time to do anything more than just teach the curriculum and grade assignments (Kim et al., 2013). The most identified barrier that is under a teacher’s control is the lack of personal time (An & Reigeluth, 2011; Assan & Thomas, 2012). This is extremely important since any form of technology integration will take time and effort from the one who is implementing it. Most teachers want to be confident of what they are doing, so it is highly unlikely that a new technology would be introduced into a classroom where a teacher has no understanding of it. This suggests that a teacher will not use a new instructional aide or technology unless they have some form of experience with it. Although additional professional development time can always be given by the administration, it really falls upon the teacher to work the training time or hands-on experience into his or her own schedule (Hechter & Vermette, 2013; Kim et al., 2013). Even though this barrier can be overcome, it must involve teachers who are committed to the learning process since overcoming it will ultimately involve the use of their own personal time.

The next barrier, lack of personal knowledge both in teaching methods and technology understanding, also takes a lot of time and commitment from the one implementing it (An & Reigeluth, 2011; Assan & Thomas, 2012; Carver, 2016). This implies that a teacher must come out of their comfort zone and explore new instructional methods in order to gain full advantage of the technology to be integrated. Taking time out of one’s workday, or using personal time in the evening, still involves time and effort from the implementing teacher. This is not an easy sell and requires the belief that what will be learned and used contains something of value for teacher and students (Carver, 2016; Hechter & Vermette, 2013; Kim et al., 2013). These barriers can be overcome, but it must involve teachers who believe in the learning process since it will involve the use of their instructional time as well as some of their own personal time.
The final barriers to a teacher’s technology integration effort in the classroom are their personal beliefs and attitudes toward teaching methods and technology (Carver, 2016; Kim et al., 2013). Again, this barrier is placed squarely on the teacher’s shoulders since it involves their own personal beliefs and attitudes learned over time. If a teacher has a personal dislike for a specific teaching method or a particular technology, it will not be used within his or her classroom. As a content area expert, the teacher presents and delivers information in a manner that is most comfortable. This suggests that each teacher is unique and uses instructional methods based on their own experiences or preferences for strategies that they like to use (Kim et al., 2013; Liu, Ritzhaupt, Dawson, & Barron, 2017). It will take time, effort, and commitment to make a change or implement a new technology since teachers want to be comfortable with the understanding of anything newly introduced into the classroom. Once again, these barriers can be overcome, but it must involve teachers who believe in the changes that are being implemented since it will involve changes in their instructional methods and strategies as well as the use of their own personal time.

According to An and Reigeluth (2011) and Salleh (2016), lack of time along with one’s personal beliefs and attitudes toward teaching methods and technology are the biggest obstacles under the direct control of the individual teacher. Although the teacher can address these obstacles, they cannot be overcome unless there are commitments as well as collaboration from all of those involved. Chen (2008) stated that inconsistencies between teacher's beliefs and practices were often influenced by external factors and misunderstanding of instructional methods needed to support a student-centered classroom. At times, conflicts between stated and acknowledged beliefs were a large part of the problem. In fact, limited parental experience with the use of technology for learning could be a barrier for integration at home which places added
pressure on the teacher to use the classroom technology effectively (Baytak et al., 2011; Chien et al., 2013). Ultimately, once the obstacles are identified, a plan of action can be instituted to address the school’s as well as the teacher’s ability to eliminate or neutralize the barriers. Unfortunately, in some cases external barriers cannot be removed, and more pressure falls on the teacher to make wholesale changes within the learning environment or their delivery and teaching methods. This is significant since many reform initiatives are hold teachers accountable for the learning that is taking place within their classroom (Bush & Wise, 2010).

**Teacher Beliefs**

As Chen (2008) and Salleh (2016) pointed out, there are often times when the stated personal belief of the teacher is very different from the teaching practice used in the classroom. According to Groff and Mouza (2008), “teacher beliefs influence professional practice” (p. 30), which means that teacher buy-in is paramount when integrating technology or modifying curriculum delivery. Higgins and Spitulnik (2008) pointed out “that teachers only change their beliefs after they have observed evidence of a change in student learning” (p. 517). Carver (2016) also pointed out that “the major reason teachers chose to use technology was because they felt it resulted in increased student engagement” (p. 115). In addition, if teachers believe that the technology will not be available, they are not likely to seek the authority or make plans to use it (Cullen & Greene, 2011; Dolan, 2016; Harper & Milman, 2016).

In other words, teachers will only use and incorporate technology integration practices that match their individual beliefs and understanding based specifically upon their own personal views. These views commonly consist of their own personal education experiences that they had while they were growing up and attending school. Cullen and Greene (2011) also stated that when technology is used for collaboration purposes, teachers engage in more collaborative
classroom activities while those who value opportunity or choice use a wider selection of technological tools for learning (Chien et al., 2013). Ultimately, it seems as though some teachers like to take risks and attempt to explore what is available, while others remain safely in their comfort zone and deliver the curriculum in the traditional, old-fashion way (Inan & Lowther, 2010b; Kafyulido, Fisser, & Voogt, 2016).

**Teacher Self-Efficacy**

Based on the current research, teacher self-efficacy is one of the most important predictors as to likeliness of technology integration efforts within the classroom (Fu, 2013; Skaza, Crippen, & Carroll, 2013; Willis, Weiser, & Smith, 2016; Yaprak, 2014). In a study by Inan and Lowther (2010a), the researchers found that “teachers who feel ready and confident to integrate technology used technology more frequently in their classroom instruction” (p. 148). In addition, Inan and Lowther (2010a) also found that individual beliefs about technology along with teacher readiness to use technology positively affected computer integration efforts. This means that once a teacher gets comfortable with a particular technology, they are more inclined to use it within their classroom setting. In another study, Mueller et al. (2008) found that the level of computer experience of a teacher is a predictor of technology integration success; whereas the higher the level of confidence, the better the opportunity for success. According to Tilton and Hartnett (2016), “an individual’s belief in their own ability to master new skills and develop competence continues to be a key aspect of any process of acceptance of change” (p. 88). This means that once a teacher feels confident within their own use of technology, they are more likely to incorporate it into their instructional practices.

While teachers regularly use technology for administrative tasks, many are not very confident when using it for teaching and learning in the classroom (Gorder, 2008).
Consequently, Gorder (2008) and Martin and Carr (2015) pointed out that teachers need opportunities for practice so they can reflect on their efforts and share when they have succeeded or find help when the implementation ended in failure. Teachers often share their triumphs with each other, which means successes are shared and copied more often. Lee and Tsai (2010) stated that teachers who possess richer experiences with technology integration had a better attitude toward using the technology or technology-based activity. Furthermore, Mueller et al. (2008) found that computer experience is a predictor for technology integration success, whereas the higher the level of experience, the better the chances are for overall success. These findings are significant since readiness to use technology in the classroom is just as important as the overall confidence of the individual teacher (Cayton, Hollebrands, Okumus, & Boehm, 2017; Ward & Parr, 2010; Zuber & Anderson, 2013). Once the understanding is established as to why teachers integrate technology in the classroom, specific approaches can be designed to encourage, assist, and support those who are willing to transform the manner in how they teach the digitally connected students found within their classrooms.

**Student Engagement**

As the learning environment begins to shift to a more collaborative approach toward student learning, teachers must bridge the technological gap and build authentic relationships with the students (Ertmer et al., 2012; Pierce & Cleary, 2016). This course of action will authenticate the classroom as a place of learning and encourage the students to be more engaged in their learning activities. The transformation from a book and paper classroom to one that incorporates technology as a method of learning has a greater opportunity to capture the tech-savvy students’ attention (Downes & Bishop, 2015; Gray et al., 2010; Pierce & Cleary, 2016). According to Courts and Tucker (2012), digitally connected students are more likely to learn in a
manner that is comfortable and familiar to them. This implies that the teacher must meet and motivate today’s students at their own comfort level, such as using the Internet or an Internet-connected device as a learning tool. In order to accomplish this, teachers have to invest some of their instructional as well as personal time in order to become more proficient in the use of technology as a learning tool. This suggests that a teacher will have to overcome some of the common barriers, such as lack of time and personal knowledge of technology integration (An & Reigeluth, 2011; Cayton et al., 2017). Ultimately, any extra time invested should be worthwhile since technology integration efforts help increase student engagement. This is significant for teachers since increased student engagement often sets the foundation for more student involvement and increases in student achievement.

**Additional Challenges**

Although not identified as some of the most common barriers to integration, revised teacher evaluations and newly created BYOD to school programs have brought forth some additional concerns. Even though teachers have no real control over these initiatives, they are affected by the manner in which they are implemented. In today’s world of education reform and accountability, the summative test scores of their students or the way in which they integrate and use technology in the classroom can adversely affect a teacher’s career (Conley & Glasman, 2008). This actually places many teachers in a defensive position where they often shift back to the common comfort zone of being an authoritative content expert in a traditional classroom setting.

**Teacher evaluations.** In today’s educational environment, accountability is on everyone’s mind. The administration wants to know how to evaluate the teachers while the teachers want to know how and what they will be evaluated on (Stumbo & McWalters, 2010).
Unfortunately, there are no easy answers since teacher evaluation systems need to have the state, district, and teacher union buy-in on what will be included as well as how it is interpreted. This means that each teacher evaluation system may be different depending on the state, district, or the administration that conceived the actual plan. Many states are now requiring that a portion of a teacher’s evaluation be based on the summative test scores of their students (Stumbo & McWalters, 2010). In cases where teachers teach a course that is not covered by a summative test, the teachers are to be evaluated on the overall scores of the summative tests used for the entire school population. This places many teachers in a position of teaching to the test instead of going in-depth into the curriculum or using technology as a learning tool. Test scores and achievement levels are now attached to each individual teacher in the school, and identifying who is effective and who is not has become commonplace throughout the educational environment (Stumbo & McWalters, 2010). The high stakes testing environment has forced teachers to spend extra time teaching the basic curriculum instead of using collaborative approaches or integrated technology, which is why some technology is integrated more often, and others just sit on the shelf without being used.

**Bring your own device.** Another challenge that is being faced by the teacher in the classroom is the district and school policies of bringing your own device to school. Since technology is very costly to purchase as well as to maintain, many districts have proposed this program as a way to get more Internet-connected devices into the classroom (Estable, 2013). Early educational reforms had many states proposing policies of moving toward a one-to-one ratio of school computers to students. Although the concept has merit, its progress has been slow, since computing technology can be very costly to purchase and it often becomes outdated within a few years. This suggests that funds purchase fewer new computers since some of the
funds are also used to repair and maintain the technology already on hand.

At any given time, there may be hundreds of cell phones, smartphones, tablets, e-readers, netbooks, or laptop computers that are being used by individual students at the same time in the same school (Estable, 2013). This places a tremendous amount of pressure on a teacher who is integrating technology into the classroom since the technology selected must be compatible for everyone’s use as well as their own device. No one wants to be placed at a disadvantage within a particular activity due to the device that they are using. This forces teachers to ask lots of questions such as: (a) will this technology work on everyone’s device, (b) will this technology allow everyone to have the same access and use of the same features, (c) will this technology be beneficial to the student on their particular platform, and (d) what needs to be done for those who do not have a device or one that does not work with this particular technology? These are tough questions for a teacher to answer every time they decide to use a particular technology within the classroom. According to Ertmer and Ottenbreit-Leftwich (2013) “technology use must, first and foremost, be designed to support learning goal, not the other way around” (p.181). Some teachers will view this as a challenge while other teachers will see it as a burden. If the technology integration effort is seen as more of a burden, teachers will move back to their comfort zone and stop integrating technology as they become that authoritative content expert within a traditional classroom setting (Inan & Lowther, 2010b).

**Summary**

According to the research, there is not an exact or specific overall definition that can encompass every situation in which technology is introduced in the classroom (Belland, 2009). Technology can be used to assist in the presentation and delivery of the curriculum as well as the daily administrative tasks related to one’s instructional duties. The types of devices that can be
used in the classroom vary widely from smartphones and PDAs to laptop computers and tablets. So, in order to accomplish a more widespread buy-in effort, a clear definition must be established to reflect both the use of technology as a tool for the teacher as well as a tool for the student learning. Therefore, attempting to develop an over-arching definition of technology integration from just a selected few of those in command or a manufacturer’s point of view is not prudent. The only definition that will stand is one that is developed through the personal experiences of those involved in technology integration efforts at the school level since it will carry more meaning and importance to those in the classroom.

In today’s society, technology is evolving at such a rapid pace that many of the latest devices purchased for today’s classrooms are obsolete in just a few years. This means that once a teacher becomes confident in a particular technology, it changes, and the learning curve starts all over again. In addition, there is now an enormous new market for small programs called “apps” that can be downloaded to any device that has Internet access. These apps are extremely powerful and can do many of the tasks that required a much larger computer just a few decades ago. Instead of constantly buying new technology and equipment, one can simply upgrade the apps and prolong the life of the technological device. This means that teachers must become more than just context area experts since they are also expected to be knowledgeable and effective with the various technologies that can enhance student learning.

In addition, many schools are now encouraging students to bring in their own Internet-connected devices as a way to get more of them on the Internet so they will be engaged and learning through technology. Thus, according to Gorder (2008), the difference in the integration effort lies more within “the teacher’s effective use of technology” (p. 65) than just its availability to be used within the classroom. It is now extremely important for a teacher to become familiar
with today’s technology. With a firm understanding of how technology can be used, the teacher can integrate current technology into the curriculum and then challenge the student to become a critical thinker. This will allow the teacher to meet the student within their own comfort zone as the teacher builds authentic relationships that enhance learning and achievement.

Since scholars such as Bandura (1977), Kaptelinin (2005), Nardi (1996), and Vygotsky (1978) believed that individuals actively construct knowledge through interactions with their surroundings, social cognitive theory (SCT) and activity theory (AT) was used as theoretical framework for this study. The use of these theories provided an understanding of how an individual learns from the interactions taking place within their environments. As technology is integrated into the classroom, perceptions are constructed through actual experiences. The newly-developed perceptions impact the individual teacher’s understanding of technology and whether its use will be continued in the classroom.

Once a better understanding of a secondary teacher’s perceptions of technology integration is gathered in regard to their individual technology self-efficacy levels, professional instruction can be developed so that it is aimed at getting the technology as well as the understanding of how it can be used effectively into the teacher’s hands. This way, the teachers can experiment, practice, and explore technology use in the classroom as a way to increase their individual experience and build their confidence level through first-hand use. According to Gorder (2008), it is extremely important to get both adequate practice and reflection time with the technology, so rich experiences can be built and stored mentally for later use. Since the teacher is once again at the evaluative point where learning takes place, they are seen as being both accountable as well as responsible for using the skills and tools required to teach the tech-savvy students who fill their classrooms. Ultimately, it seems to come down to the personal
commitment and confidence of the teacher, which is solely based upon their individual beliefs and their technology self-efficacy level for the situation at hand (Kafyulido et al., 2016; Su, 2009).
CHAPTER THREE: METHODS

Overview

The purpose of this phenomenological study was to focus on the lived experiences of secondary teachers as they select and integrate technology into their secondary classroom based upon their individual level of technology self-efficacy. By investigating the similarities and differences, this study sought to discover a comprehensive meaning of technology integration as perceived and defined by those at the various levels of individual technology self-efficacy. In addition, the study will strive to gain a better understanding of the factors that impact the individual choices of technology used as well as the reasoning behind these decisions. The understandings gained through this study will have an impact on future methods and plans of how to encourage, motivate, and train teachers in the incorporation and use of technology within the secondary school environment.

Design

Schwandt (2007) defined a phenomenological study as an examination of the “everyday experience” (p. 226) from the individual’s point of view. A phenomenological approach was correct because the study sought to: (a) describe the common meaning, (b) examine a specific phenomenon, (c) focus on related individuals, and (d) understand the lived experiences in regard to the stated phenomenon (Moustakas, 1994). The study was conducted in a qualitative manner as I strived to understand and communicate the lived experiences of those secondary teachers who had incorporated technology within their individual classrooms. For this investigation, the study used a questionnaire, face-to-face interviews, classroom observations, and focus groups. The data collection techniques and methods of this study were appropriate because they were used in qualitative studies that follow a phenomenological approach (Creswell, 2013). In
addition, the course of action was correct since phenomenological studies seek to investigate what has been experienced as well as how it was experienced by a connected group of individuals (Creswell, 2013; Moustakas, 1994).

**Research Questions**

The study was designed to garner an in-depth understanding of the perceptions of secondary teachers in regard to their technology self-efficacy level as they incorporated technology within the secondary school environment. Since everyone had a different level of technology self-efficacy, it was important to investigate the factors that influenced their decisions when implementing technology within the secondary classroom. In order to gather this detailed information, the study examined the following research questions:

**RQ1:** How do teachers define technology integration in today’s secondary classroom?

**RQ2:** How do teachers make decisions about the type of technology to use in their secondary classroom in regard to their level of technology self-efficacy?

**RQ3:** How does the teacher’s individual level of technology self-efficacy impact the application of technology used within the secondary classroom?

The participants’ lived experiences gathered in response to the research questions provided a rich narrative and a better understanding of a secondary teacher’s perceptions of technology integration in regard to their individual technology self-efficacy levels.

**Setting**

The site selected for this study was the west side of the Beach County Public School District (a pseudonym). The location was a medium to large-sized school district located in the Southeastern United States. The district had 84 total schools, including 13 high schools and 15 middle schools (Unnamed Superintendent, 2011). The west side of the county consisted of six
large, five medium, and four comparatively smaller-sized secondary schools. The district ranked as one of the 10th largest in the state, which made it one of the top 50 largest school districts nationally (Unnamed Superintendent, 2011). At the time of the study, over 98% of the teachers within the school district had 24-hour access to their own modern, district-provided classroom computer (Unnamed Superintendent, 2011). In addition, the district had a “computer-to-student” ratio of 3.4 to one (Unnamed Superintendent, 2011). This site was selected due to their commitment to increase technology use throughout the district as well as maintaining the goal of achieving a one-to-one computer-to-student ratio in the future (Unnamed Superintendent, 2011).

**Participants**

The initial participant recruitment pool consisted of approximately 400 secondary teachers who were assigned to the selected secondary schools located on the west side of Beach County (a pseudonym). The TICS questionnaire was sent out to five secondary schools with a total teacher population of 392. The participants were invited by email to complete the TICS questionnaire. The questionnaire was open and available for approximately 30 days. The initial questionnaire response rate was 11% as 43 participants responded out of a possible 392. Of the 43 participants who responded, only 37 completed the entire questionnaire and the corresponding participant consent form, which lowered the potential participant response rate to 9.4%. The low response rate may be attributed to the start date of the study since the questionnaire was sent out during the second-semester teacher evaluation period. In addition, the questionnaire also took place during the end-of-the-year testing window for the district’s state-mandated assessments.

After the questionnaire was closed, the respondents were segmented into three distinct groups: (a) low technology self-efficacy (scoring in the lowest third), (b) average technology self-efficacy (scoring in the middle third), and (c) high technology self-efficacy (scoring in the
highest third). The potential sample population consisted of 24 female and 13 male respondents. The mean technology confidence score was 3.52 on a scale from zero to five. The low technology self-efficacy group scores ranged from 0.5 to 3.25 and contained 12 potential participants. The average technology self-efficacy group scores ranged from 3.36 to 4.11 and contained 12 potential participants. The high technology self-efficacy group scores ranged from 4.25 to 5.0 and contained 13 potential participants.

Once the segmentation was completed, a group of 15 teachers (five from each self-efficacy level) were selected and invited to participate in the face-to-face interviews, classroom observations, and focus groups. Although a phenomenological study could have more participants, the selection number was based on Dukes’ (1984) recommendation of at least 10 participants per phenomenon studied. According to Dukes (1984), this sample size helps a researcher to stay focused so they see “what is there to be seen” (p. 200) instead of “seeing what they want to see” (p. 200).

For convenience, the participants were purposively selected from a pool of secondary teachers who had used technology in the classroom and had completed the TICS questionnaire. Purposive sampling was used when participants were selected due to “their relevance to the research question” (Schwandt, 2007, p. 269). Because the study looked at specific levels of the technology self-efficacy, it was important to select participants from those who had only used technology within the secondary environment. Even though the type of technology may have varied from school to school, it was the deliberate introduction and use of it that mattered. In addition, there were no restrictions placed on age, race, experience, education level, or subject matter taught.
After my dissertation committee was assembled and my proposal was successfully defended, I applied for my Institutional Review Board (IRB) approval from Liberty University. During the IRB approval process, I completed the research application for the Beach County School District. The school district’s application for conducting research had to be submitted and approved by the school district before receiving approval from the Liberty University IRB. Once the school district’s application was signed by my dissertation committee chair, I submitted it to the school district’s office. Under the direction of the Liberty University IRB, I waited for the school district’s approval (see Appendix A). Once the school district granted approval, I resubmitted the IRB application to Liberty University. Once I had received the final approval from the Liberty University IRB (see Appendix B), I started the research process.

After receiving approval from both the Liberty University IRB committee and the school district, I personally contacted each selected secondary school principal on the west side to obtain their approval to use their school faculty as potential research participants (see Appendix C and Appendix D). In order to help gain the approval from each principal, I offered to share the overall descriptive statistics of the faculty that responded to the TICS questionnaire with them. This information should be very helpful in future school-related technology decisions and professional development training courses.

Once each principal’s approval was obtained, I proceeded to administer the TICS questionnaire online to the school’s faculty. Each potential participant received an online link to the TICS questionnaire which was sent by email (see Appendix E and Appendix F) to every secondary teacher at each participating school location. The TICS questionnaire had the consent form (see Appendix G) incorporated in the online format so that participants could sign it.
electronically. The TICS questionnaire was hosted by the Survey Monkey web site. Once the questionnaire was closed, I analyzed the responses. The categorical responses from each TICS questionnaire were converted to a simple overall average score, ranging from zero to five, whereas the higher the TICS score, the higher the level of technology self-efficacy. Respondents were then grouped by overall scores of the lowest third for low technology self-efficacy grouping, the middle third for average technology self-efficacy grouping, and the highest third for high technology self-efficacy grouping.

**Pilot Study**

After the groupings were completed, I conducted a small pilot study of the one-on-one interviews questions (see Interviews). The pilot study consisted of three secondary teachers, since Gall, Gall, and Borg (2007) suggested that “for many quantitative and qualitative research studies, two or three participants may be sufficient” (p. 56). Once the participants were identified, I contacted them and set up an interview in a non-threatening environment, which was their school conference room. The pilot study interviews lasted 10 to 15 minutes and were audio recorded for transcription purposes. The audio was recorded by using two different digital voice recorders, one was used as the primary device and one was used as the backup device. In addition, a Mac laptop was used to record and transcribe the audio recordings. After transcribing the interviews, an initial analysis was conducted to ensure that the interview questions met both face and content validity. According to Schwandt (2007), validity means that the facts are true, such “that the findings accurately represent the phenomena to which they refer” (p. 309). In other words, the information gathered from the interview questions must align to the research questions of the formal study. If the responses to the interview questions failed to measure the intended phenomenon being researched, then the questions would be modified accordingly.
Formal Study

After completing the pilot study, I selected three to five participants from each self-efficacy level and formed three specific groups: (a) low technology self-efficacy, (b) average technology self-efficacy, and (c) high technology self-efficacy for the formal study. After being segmented into the three self-efficacy levels, 15 teachers were selected and invited to participate in the formal study (see Appendix H and Appendix I). The informed consent to participate was granted during the completion of the TICS questionnaire. Each participant was interviewed once in a convenient, non-threatening setting, which was the participant’s school conference room. Once the interviews had been completed, a single on-site field observation was conducted. The individual participants selected one of their own classroom lessons for the on-site observations. All information and data gathered during the classroom visit were recorded as field notes on an observation template form (see Observations). After all classroom observations were completed, three separate focus groups were conducted. The focus groups were based upon the three-segmented technology self-efficacy levels used in the study: (a) low technology self-efficacy, (b) average technology self-efficacy, and (c) high technology self-efficacy. The focus groups were conducted in a convenient, non-threatening setting, which was the local school’s conference room that was equal distance from all the participants.

The interview and focus group sessions were audio recorded using two different digital voice recorders, whereas one was used as the primary device and one was used as the backup device. In addition, a Mac laptop was used to record and transcribe the audio recordings. After all the data had been collected, it was transcribed verbatim and analyzed according to the seven steps prescribed by Moustakas (1994). Once the data had been analyzed, three member checks were conducted to ensure that the findings were reflective of what the participants stated during
the data collection process. In addition, all data gathered was stored on the researcher’s password-protected computer or in a locked cabinet in the researcher's home office, whereas the researcher possessed the only available key to the locked cabinet.

**Researcher’s Role**

I personally conducted the research in this study as well as provided a detailed overview of my technology integration beliefs and experiences within the classroom. Currently, I am a business education and computer application instructor at a large-sized middle school where I instruct seventh and eighth grades students in word processing, spreadsheets, and electronic presentations. This position provides insight into how technology use flows through the secondary school environment. I regularly witness the success and failures of teachers who are using the same technology that I employ with my students. With this in mind, I want to help develop a setting that is both effective and productive in the use of technology for student engagement.

Presently, I hold an Associate of Arts degree in information systems technology, a Bachelor of Arts degree in business management and economics, a Master of Arts degree in curriculum and instruction, and an Education Specialist degree in educational leadership. In addition, I am currently working towards an Education Doctorate degree from Liberty University. Initially, my journey started in a middle-class family setting where I was taught the meaning of faith, perseverance, hard work, dedication, and the value of an education. I built upon this foundation and earned a scholarship to college, becoming the first person from my family to graduate with a degree. Throughout my life, I have always been fascinated by the rapidly changing technology around me.

After graduation, I joined the military and spent four years in a computer communication
center. In this setting, I learned about computer technology as well as its applications. After leaving the military, I became a computer application instructor in the public school setting. Within this setting, I try new approaches as I seek to integrate technology into my curriculum. In addition to my technology integration efforts, I am entering into my 11th year of coaching and my 15th year of teaching at the middle school level. Ultimately, I believe that great leaders are nurtured and grown from a solid foundation of personal beliefs and Christian faith.

As a researcher, I recognized that my role was to collect and analyze data through an unbiased lens. Although I had extensive experience with technology used in the classroom, I set aside my worldviews and examined the data without any preconceived ideas. Even though I knew and worked with some of the participants, I did not have a position of authority over them. There was no compensation for participating in the study. Any pre-existing professional association or relationship did not affect my role as an unbiased researcher or impact a participant’s involvement in the research study. I separated my professional relationships with any participants by adhering to the planned procedures as detailed in this chapter. Furthermore, participation in the study was voluntary, and it did not affect any current or future relationships between the participants and their respective co-workers, individual schools, or school district.

Data Collection

For this study, four data collection methods were employed: (a) a questionnaire, (b) interviews, (c) observations, and (c) focus groups. The questionnaire was used to collect data in regard to individual technology self-efficacy levels. The data collected was reported in a descriptive manner and used purposively for participant selection and self-efficacy group formation. The study collected data in the following sequence:

(1) Questionnaires/Surveys – used to purposely select the study participants.
(2) Interviews – used to gather uncorrupted individual views, perspectives, and experiences of technology integration for each participant.

(3) Observations – used to validate individual technology self-efficacy levels and to provide insight into how technology is actually used in the secondary classroom.

(4) Focus groups – used to garner in-depth perspectives based on the technology integration experiences in the secondary classroom as well as successes and failures for each participant.

The data collection plan was established in this order as a way to garner individual views and perspectives before focus group collaboration, which could have suppressed individual experiences and allowed for groupthink of the participants. Triangulation was ensured through the use of the three primary collection methods: (a) face-to-face interviews, (b) classroom observations, and (c) focus groups. Triangulation was accomplished by using at least three different methods of data collection since it showed that the data was represented or collected in several different corroborating forms (Creswell, 2013). Triangulation is important to a qualitative study because it ensures the fact that validity had been established and satisfied by the researcher’s method of data collection (Schwandt, 2007).

Surveys/Questionnaires

A questionnaire was used to identify potential participants based upon their individual technology self-efficacy score. A questionnaire is a commonly used instrument to gather structured data using closed-end, short-answer, or scaled-answer questions (Schwandt, 2007). For this study, the TICS questionnaire (see Appendix J) was used as the collection instrument. It was developed by Jeremy Browne at the State University of New York at Brockport and is available for use as a data collection tool through the Creative Commons Attribution, Share-
Alike license protocol (see Appendix K). The instrument can be used in a study without permission as long as the following two stipulations are met: (a) attribution must be given to Jeremy Browne as the original creator of the scale and (b) if the scale is altered, the resulting new scale must be released under the same license. This instrument was tested and validated by the developer through his own studies (Browne, 2011).

According to Browne (2009), the TICS questionnaire was reliable and valid as a general survey instrument since all TICS subscales demonstrated acceptable levels of reliability, such that $\alpha$ was between .80 and .90. The TICS questionnaire consists of 28 items, ranging in answer choices from: (a) Not confident at all, (b) Slightly confident, (c) Somewhat confident, (d) Fairly confident, (e) Quite confident, and (f) Completely confident. The TICS questionnaire was used to return a simple overall average self-reported technology confidence score for each individual. The TICS score was calculated by adding the numeric value for each response given, such as zero for not confident at all up to five for completely confident. The total numeric score was then divided by the number of total responses, thus providing a simple overall average score, ranging from zero to five, whereas the higher the TICS score, the higher the level of technology self-efficacy. The overall average scores were then used to group all respondents, whereas the lowest third was placed into the low technology self-efficacy group, the middle third was placed into the average technology self-efficacy group, and highest third was placed into the high technology self-efficacy group. The questionnaire was administered at the beginning of the study, so a purposive sampling could be derived to select participants and formulate groups according to their technology self-efficacy level.

According to Creswell (2013), questionnaires do not usually contain open-ended questions, which means that their purpose must be both specific and focused if used. Since the
data collected from the questionnaire was used for the specific purpose of selecting participants and formulating groups, the questionnaire’s use was aligned with the sampling suggestions provided by Creswell (2013). With this in mind, the qualitative study only reported the descriptive statistics of the TICS questionnaire, such as the sample size of the study and the mean, median, and mode for the technology self-efficacy levels of those who responded. In addition, the demographics gathered from the questionnaire were reported, such as gender, age, and years of teaching experience. The TICS questionnaire was used to purposively select 15 participants from the total respondents that were segmented into groups based on their individual technology self-efficacy level.

**Interviews**

Interviews were conducted in a face-to-face manner using a semi-structured approach. The semi-structured interview format began with several preset questions before expanding into other areas of relevant discussion put forth by the participant. According to Schwandt (2007), the semi-structured approach allows for one to gather in-depth information as well as authentic stories related to the phenomenon being studied. All interviews took place in a setting that was comfortable and non-threatening to the participant. Each participant was interviewed once. The interviews were audio recorded and lasted 15 to 30 minutes in length. Each interview used semi-structured, open-ended questions. According to Schwandt (2007), interviews are a method that allows one to probe more deeply for “in-depth” (p. 164) participant knowledge. This was a valid data collection method for use in a phenomenological study since it sought to gather information about a participant’s past-lived experience with a phenomenon that was being studied (Moustakas, 1994). This data collection method was focused on gathering information in order to answer the following research questions: (a) How do teachers define technology integration in
today’s classroom and (b) How do teachers make decisions about the type of technology to use in their secondary classroom in regard to their level of technology self-efficacy?

The face-to-face interviews were conducted after participant selection and their acceptance to participate in the study. The interviews took place in a non-threatening environment so the participant was comfortable and the researcher could take notes as well as audio record the conversation. The interviews were audio-recorded using two different digital recording devices. The primary recording device used was an Olympus WS-823 digital voice recorder. The backup device used was an Olympus WS-822 digital voice recorder. In addition, a Mac laptop was used to record and transcribe the audio recordings. Field notes were taken during each individual interview. Although I had preselected several questions as the interview starting points, I reserved the right to modify any of the listed prompts based on the results of the pilot study that was conducted. The following interview questions were used as the starting point for all participant interviews:

(1) What does technology integration within the secondary classroom mean to you?
(2) What criteria do you use when selecting technology for your secondary classroom?
(3) Describe a time when technology integration in your secondary classroom went better than expected.
(4) Describe a time when technology integration in your secondary classroom did not go as planned.
(5) What type of obstacles have you faced while integrating technology into your secondary classroom?
(6) What steps have you taken to increase your knowledge and ability to integrate technology within your secondary classroom?
(7) Is there anything else that you would like to tell me about your experiences of incorporating technology into the classroom?

These interviews questions were designed to elicit individual lived experiences of the participants so an understanding of the phenomenon could be achieved. According to Oncu et al. (2008), teachers are one of the most crucial components within the educational setting. Since teachers perform a major role in the technology integration process, their beliefs, perceptions, and experiences are important (Cullen & Greene, 2011; Gorder, 2008; Inan & Lowther, 2010a; Mueller et al., 2008). Question one examined these underlying influences as the participants were encouraged to describe technology integration in their own words. Question two followed up on the impact of these influences since the participants were encouraged to explain their decision-making criteria in regard to their technology integration.

Questions three, four, and five were designed to identify the common factors that were present when integration efforts went better than expected as well as not as planned. These factors are commonly referred to as barriers to technology integration (An & Reigeluth, 2011). Kim et al. (2013) identified several obstacles that are under a teacher’s direct control such as: (a) lack of time, (b) lack of knowledge, and (c) personal beliefs and attitudes toward technology. Thus, gaining an understanding of these factors from a teacher’s point of view helps the stakeholders to realize what is important in the classroom (Mueller et al., 2008). Question six allowed the participant to reflect on what they had done to become better at technology integration since it is extremely important to share successes as well as failures (Gorder, 2008). Question seven was provided so the participant could expand on anything that was perceived as significant or overlooked since the study was focused on individual teacher’s perspectives and actual experiences with technology integration (Cullen & Greene, 2011; Gorder, 2008; Inan &
Lowther, 2010a; Mueller et al., 2008).

**Observations**

According to Schwandt (2007), observations are commonly used for gathering actual “accounts of everyday social action” (p. 211). As the researcher views the people under study, a better understanding of group interactions can be developed based on the actions and the events observed. Since Creswell (2013) pointed out that this type of information-gathering method is commonly found in qualitative studies, observations are appropriate when using a phenomenological approach. The observations were conducted after the initial interviews were completed. Each teacher was observed once in their natural classroom setting. The observations lasted approximately 30 to 45 minutes. Each teacher had control over the lesson selected as well as the time chosen for the observation. The classroom observations took place between 8:30 a.m. and 3:00 p.m. during the normal Monday through Friday school day schedule.

The researcher began each classroom observation as a non-participant observer and then moved to a participant observer so that in-depth observations could be focused on the technology being used and the interactions taking place within the classroom environment. As a participant-as-observer, the researcher gained an insider’s view of the activities conducted in the classroom. According to Schwandt (2007), a participant-as-observer is marginally involved in the activities that are being studied so that observations can be made and notes can be taken without interrupting the actual activity. The observed teacher served as the point of contact for the initial introduction of the researcher to the students.

The Observation Protocol for Technology Integration in the Classroom (OPTIC) observation template was used as a data collection tool. This tool was designed by the Northwest Educational Technology Consortium (NETC) and is designed to assist in the
observation and evaluation of technology integration within the curriculum (Northwest Educational Technology Consortium, 2005). This observation tool is free to use and modify according to the needs of the researcher (see Appendix L). To use this tool, I must state that it was developed by the NETC (Northwest Educational Technology Consortium, 2005). The OPTIC was used for classroom observation and field notes were recorded as needed.

A detailed map of the room was completed during the visit, focusing on where the technology was located. Field notes were taken with regard to where the teacher/student technology interactions took place. The observations focused on the teacher and students, especially the type of technology used as well as the methods of integration. In regard to technology, field notes were collected on the roles and strategies used, including engagement levels. In addition, detailed notes were taken on the physical setting, classroom atmosphere, and teacher/student attitudes displayed during lessons and activities that involved the application of technology within the classroom.

This method of data collection was valid for use in a phenomenological study since it sought to gather information about a participant’s actual experience in their natural setting (Moustakas, 1994). This data collection method was focused on gathering information in order to answer the following research question, “how does the teacher’s individual level of technology self-efficacy impact the application of technology used within the secondary classroom?” The best way to confirm your level of technology integration is to use technology in a live classroom setting. This type of observation should help to substantiate teacher confidence and self-efficacy levels since more teacher confidence often leads to visible impacts on student learning.
Focus Groups

Three specific focus groups were conducted, one for each grouped level of technology self-efficacy: low, average, and high. Each group consisted of at least three teachers who scored at that specific individual technology self-efficacy level. The focus group interviews were audio-recorded using two different digital recording devices. The primary recording device used were an Olympus WS-823 digital voice recorder. The backup device used was an Olympus WS-822 digital voice recorder. In addition, a Mac laptop was used to record and transcribe the audio recordings. Field notes were taken during the focus group interview process. The focus group interviews lasted approximately 30 to 45 minutes and took place after the classroom observations had been conducted. The focus group interviews were semi-structured (see Interviews) and used open-ended questions for discussions.

According to Schwandt (2007), focus groups are a method that allows one to probe more deeply for in-depth participant knowledge on a particular issue or phenomenon. This was a valid data collection method for use in a phenomenological study since it sought to gather information about a group of individuals who have a shared experience with a phenomenon that was being studied (Moustakas, 1994). This data collection method was focused on gathering information in order to answer the following research question: (a) How do teachers define technology integration in today’s classroom, (b) How do teachers make decisions about the type of technology to use in their secondary classroom in regard to their level of technology self-efficacy, and (c) How does the teacher’s individual level of technology self-efficacy impact the application of technology used within the secondary classroom?

The semi-structured format began with several preset prompts before expanding into other areas of relevant discussion put forth by the participants. Although I had preselected
several questions as the focus group starting points, I reserved the right to modify any of the listed prompts based on the initial analysis and feedback received from the one-on-one interview sessions. The following questions were used as the starting point prompts for all focus groups:

(1) As a group, how would you define technology integration within the secondary classroom?

(2) List and explain the most important criteria used when selecting technology for a secondary classroom.

(3) What are the most common factors present when technology integration goes better than expected?

(4) What are the most common factors present when technology integration does not go as planned?

(5) What are the most difficult obstacles faced while integrating technology into the secondary classroom?

(6) What steps have you taken to share your knowledge and ability about your success with the way you integrate technology within the secondary classroom?

The focus group questions were designed to examine the collective lived experiences of the participants in regard to their associated technology self-efficacy level. My investigation allowed for a better understanding of the phenomenon based on three uniquely different perspectives. Since teachers are significant components within the educational environment, it is important to understand their individual points of view (Cullen & Greene, 2011; Gorder, 2008; Inan & Lowther, 2010a; Oncu et al., 2008). According to Mueller et al. (2008), teachers make technology integration decisions based on three influential factors, their personal beliefs, individual perceptions, and real-life experiences. Question one examined the factors that define
technology integration so a more collaborative definition could be formulated. In addition, question two sought to find the most important factors behind the decision-making process that involved technology integration in the secondary classroom. The focus group participants were encouraged to share as they worked toward a consensus. Their shared insight and experiences should help to provide a better understanding for the stakeholders involved. Questions three and four addressed the commonalities that were experienced when technology integration goes better than expected as well as not as planned since important lessons could be learned from both efforts. Chen (2008) pointed out this situation and stated there are times when the expressed beliefs of the teacher are very different from the actual teaching practices used in the classroom.

Question five was designed to take a collaborative view of the barriers to technology integration since different barriers could be more profound to specific self-efficacy levels. Kim et al. (2013) pointed out that less confident teachers often take a wait and see approach to technology integration since they lack the knowledge and experience of using it. In addition, Kao and Tsai (2009) stated that those with higher technology self-efficacy levels tend to use more technology in the classroom. This means that it is important to investigate the teacher’s perspective from the various levels of self-efficacy. Question six was provided so the collaborative group could address anything that might have been overlooked or perceived as insignificant in the discussions since the study was focused on teacher’s perspectives and actual lived experiences with technology integration (Cullen & Greene, 2011; Gorder, 2008; Inan & Lowther, 2010a; Mueller et al., 2008).

**Data Analysis**

I accomplished the data analysis by hand using the following computer applications: Word, Excel, and HyperTranscribe. The Word program was used for all documents that required
word processing. The Excel program was used for all mathematical calculations, comparisons, and sorting tasks. The HyperTranscribe program was used to transcribe all audio files recorded during the interview and focus group process. The data analysis of this study followed the steps as prescribed by Moustakas (1994) for use in a phenomenological study (p. 122):

1. Bracketing (Epoché) - stating of your own personal knowledge and experience in regard to the phenomenon under study (Schwandt, 2007).

2. Record all relevant statements. Consider each statement with respect to the significance for a description of the experience.

3. List each non-repetitive, non-overlapping statement. These statements are commonly referred to as invariant constituents, which Moustakas (1994) defined as “invariant horizons, or meaning units of the experience” (p. 122).

4. Relate and group invariant constituents into clustered meaning units and themes.

5. Synthesize the meaning units and themes into a description of the texture of the experience. Include related verbatim examples from the transcripts.

6. Reflect on your own textual description and construct a description of the structures of your own experience.

7. Construct a textual-structural description of the meanings and essences of your experience.

8. Construct a composite textual-structural description of the meanings and essences of the experience under study.

Initially, I bracketed (epoché) my personal knowledge and experience with technology integration so I could establish a clear lens from which to view the data collected. According to Schwandt (2007), this will enable me to “set aside” (p. 24) personal assumptions that are within
my own worldview so concentration can be focused on the phenomenon under study without undue bias. After bracketing my personal knowledge and experience, all interview and focus group transcripts were individually transcribed verbatim. Once the transcription process had been completed, the transcripts were read from beginning to end several times in order to immerse myself into the participants’ lived experiences.

After reading the transcriptions numerous times, I began to list every statement that was relevant to the phenomenon under study since all statements carry the same weight at the beginning of the data analysis (Moustakas, 1994). Next, I grouped all the non-repetitive, non-overlapping statements into invariant constituents. According to Moustakas (1994), an invariant constituent identifies a unique quality or concept that begins to stand out as the data is analyzed. Each invariant constituent was examined to see if it could be labeled or identified as a lived moment of experience or clustered meaning unit. If the statement met the criteria, it was considered a grouped meaning unit and it was moved to the next step, clustering of statements and the identification of themes. As the statements were continuously compared and reviewed, significant-shared experiences began to emerge in regard to the phenomenon under study.

Once the theme identification process was completed, I began to develop a thick narrative of the participants’ lived experiences. According to Schwandt (2007), a thick description is a manner of portraying the phenomenon under study in “the circumstances, meanings, intentions, strategies, and motivations that characterize a particular episode” (p. 296). In doing so, I included relevant, verbatim examples from the interview and focus group transcripts so the lived story would be evident, which was important since the participants’ voices needed to be heard. In addition, I included descriptions of the setting and atmosphere from which the experience occurred.
The final step of the process was the development of a composite description of the phenomenon under study. According to Moustakas (1994), a composite description captures the dynamic lived experience in vivid, clear, and vibrant manner. In addition, the composite description brings the character and dynamics of the phenomenon to the forefront. After completing the initial draft, I shared the thick narrative description with several participants as part of the member checks process (see Trustworthiness). In addition, I also reviewed the narrative and reflected upon the feedback given before refining the narrative into the essence of the experience. The final narrative version explains what participants experienced as well as how they experienced it. This was important since the goal of this phenomenological study was to discover the essence of the experience so it could be recorded in a rich-textural description that others could learn and benefit from (Moustakas, 1994).

**Trustworthiness**

In order to ensure trustworthiness, the study used several specific, rigorous criteria that supported the credibility, dependability, confirmability, and transferability of the data collection and analysis process.

**Credibility**

Credibility is a process in which a researcher takes into account all the complexities that exist within a study while addressing the problems that are not so easily explained (Gay, Mills, & Airasian, 2009). In order to support credibility, this study employed two specific qualitative methods to the data collected: (a) triangulation, and (b) member checks. Triangulation was achieved when several methods of data collection were used in the study. In order to accomplish this, the study used three distinct qualitative data collection methods: (a) interviews, (b) observations, and (c) focus groups.
Member checks, as defined by Schwandt (2007), is the process of “corroborating the findings” (p. 187) by allowing the participants to review and validate the accuracy of the transcripts as well as the narrative of the phenomenon being studied. Member checks were employed as a method of achieving credibility since I met with some of the participants to allow for verification of what was reported. The participants read through the initial narrative, ensuring that the accounts of the lived experiences were correct, accurate, and credible according to their individual experiences (Creswell, 2013). This was important because the participants were the ones who verified and validated the accuracy of what was reported. The researcher was not the sole authority of how and why the phenomenon occurred. Thus, member checks provided the additional voice that was needed before the final narrative was completed.

**Dependability**

Dependability is the process of examining the stability of the data (Gay et al., 2009). Within this study, dependability was achieved through the use of authentic samples and direct quotes in the narrative as well as an audit trail of the data collection and analysis process. The use of authentic samples and direct quotes in the narrative helped to ensure fair and balanced accounts that were both dependable and accurate (Schwandt, 2007). In addition, an audit trail was used as a method of recreating and following the same steps that were used for the data collection and analysis in the study. An audit trail, as defined by Schwandt (2007), “is a systematically maintained documentation system” (p. 12), which allows an outside researcher the opportunity to evaluate and confirm the findings of the study.

**Confirmability**

Confirmability is the concept where the study is objective or neutral in nature and free from preconceived notions or bias of the researcher (Gay et al., 2009). In other words, the
results of the study could be confirmed or duplicated by others who follow the same basic procedures. This study accomplished confirmability through the use of triangulation and reflexivity.

Triangulation, according to Schwandt (2007), is the process “of checking the integrity of the inferences one draws” (p. 298) by the use of multiple data collection methods. For this study, triangulation was achieved by using three separate and distinct qualitative data collection methods: (a) interviews, (b) observations, and (c) focus groups. This was important since it showed that the data collected was not one-sided and that it was represented in several different corroborating forms (Creswell, 2013).

Reflexivity, as defined by Schwandt (2007), refers to the constant reflection that a researcher engages in throughout the data collection and analysis phase as a method to help to ensure credibility and authenticity by reducing the potential of personal biases being introduced. For this study, reflexivity was achieved through the process of positioning myself within the narrative of the study, which was what Moustakas (1994) recommended for phenomenological researchers. By doing so, I became more conscious of the beliefs, biases, and experiences that I brought to the phenomenon being studied. In addition, I shared my position and experiences (epoché) of technology integration as well as how these had influenced my understanding of it (see Data Analysis). This was important because it revealed how well I identified my prior beliefs while holding myself accountable for the results that were reported (Creswell, 2013).

Transferability

Transferability is the understanding that a reader can apply the concept that is being researched to his or her own work (Gay et al., 2009). The reader often asks questions such as “how similar is this situation to the one that I am working on?” or “can the results of this
situation be applied to my particular research study?” Transferability can be accomplished by providing a full and descriptive narrative of the study so the reader can easily identify with the setting and the overall situation (Gay et al., 2009). In order to accomplish transferability, this study used a thick narrative that included context-relevant statements of the phenomenon being studied. According to Moustakas (1994), a thick narrative captures the character and dynamics of a lived experience in rich, transparent, and lively manner. In addition, the thick narrative brought the phenomenon experienced to the surface and allowed for its comparison to other situations.

**Ethical Considerations**

Ethical considerations were addressed throughout the entire study. Before starting the study, I obtained an IRB approval from Liberty University as well as the research approval from the district under study. All participants in the study signed a consent form that explained the objectives of the study. The consent form also advised the participant that they could leave the study at any point. As a measure of personal protection, pseudonyms were used for the participants and individual schools as well as the individual school district. In addition, all information collected was kept confidential. Additionally, I protected the identity of all participants involved in the study as I kept any information and data collected in a securely locked cabinet. All interviews and focus groups were semi-structured in nature and used an interview script as a starting point in order to maintain consistency. Any electronic documents, files, or programs used were password protected and accessed only by the researcher. I also maintained an audit trail that could be used for an independent review.

As noted in the section of this dissertation for the researcher’s role, I sought to conduct the research steps through an unbiased view. I knew and worked with some of the participants.
However, I did not have an authority position over them. Participants did not receive compensation for taking part in this voluntary study. I followed the planned study procedures in order to obtain information.

**Summary**

This study was qualitative in nature and used a phenomenological approach as detailed by Moustakas (1994) since the study sought to: (a) describe the common meaning, (b) examine a specific phenomenon, (c) focus on related individuals, and (d) understand their lived experiences. This study employed the use of the TICS questionnaire to purposely select 10 to 15 participants who had used technology within the secondary classroom. The potential participant pool consisted of approximately 400 secondary teachers employed on the west side of Beach County. The questionnaire was used to segment the respondents of the questionnaire into three levels of technology self-efficacy: (a) low, (b) average, and (c) high. Ideally, three to four participants were selected from each self-efficacy level grouping since the desired sample size was 10 to 15 participants.

The study also used face-to-face interviews, field observations, and focus groups to gather individual perceptions of technology integration because according to Schwandt (2007), a phenomenological study seeks to examine the everyday experience from the individual’s point of view. In addition, the data collection methods provided a way to gather in-depth lived experiences of the participants, which allowed for a synthesis of the descriptions obtained so the real essence of the phenomenon under study could be put forth. The data analysis process followed Moustakas’s (1994) seven steps of data analysis.

The method of study selected was correct since phenomenological studies seek to investigate what was experienced as well as how it was experienced by a related group of
individuals (Creswell, 2013). Since trustworthiness was important to the study, several rigorous criteria were employed to support credibility, dependability, confirmability, and transferability of the data collection and data analysis process used in this study.
CHAPTER FOUR: FINDINGS

Overview

The purpose of this phenomenological study is to examine how teachers from various levels of technology self-efficacy perceive and implement technology within their secondary classroom. This chapter presents the participants, demographics, and introductions, the findings for the research study, and a summary. I used a phenomenological methodology so the focus could be placed on the lived experiences of secondary teachers as they select and integrate technology into their classroom. I employed a questionnaire to determine the individual teacher’s overall technological self-efficacy level. I used the results of the questionnaire to purposively select and segment participants into three levels of technological self-confidence: (a) low technology self-efficacy (lowest third), (b) average technology self-efficacy (middle third), and (c) high technology self-efficacy (highest third).

Once the groupings are complete, I individually interviewed participants and observed participants in their natural classroom settings. I observed during a lesson that incorporated the use of technology. After I completed the classroom observations, I formed and conducted three focus group sessions. The three guiding research questions provided a starting point for analyzing the gathered data and provided evolving themes for the study.

The following research questions were explored during this study:

**RQ1**: How do teachers define technology integration in today’s secondary classroom?

**RQ2**: How do teachers make decisions about the type of technology to use in their secondary classroom with regard to their level of technology self-efficacy?

**RQ3**: How does the teacher’s individual level of technology self-efficacy impact the application of technology used within the secondary classroom?
The data was collected and analyzed according to the data analysis procedures defined in Chapter Three. Once the analysis was completed, I developed a composite description of the meaning and essence gathered from the participants lived experiences with technology integration. The emergent themes and sub-themes are presented and followed by a chapter summary.

Participants

The 10 participants in this study ranged from 33 to 62 years of age. Five of the participants were female, and five were male. All of the female participants were white. The male participant group contained four white males and one black male. The participants in the study were either a core subject area, an elective, or Exceptional Student Education (ESE) teacher. Their classroom teaching experience ranged from a low of two years to a high of 32 years of experience. Three participants had earned an advanced degree while two were recognized as having a National Board Certification. Even though specific attributes are presented for each participant, a pseudonym is used for each participant in this study.

Stacy

Stacy was a white female teacher who taught an elective reading course that was designed to help the low-level struggling learners get back to their respective grade levels in reading. During my interview, she revealed that the majority of her teaching experience had come at the secondary level, even though she had 13 years of elementary experience. Stacy also stated that she had taught math, science, social studies, reading, and language arts, but she stated that reading had always been her favorite subject area. During my conversation with her, I found that she was full of energy and that she was not afraid to voice her opinion on whatever topic we discussed. Although she stated that she had a low level of technology self-confidence, she did
not shy away from attempting to use technology in her classroom (Stacy, personal communication, May 19, 2015).

During the classroom observation, Stacy demonstrated a tremendous amount of patience as she helped students who were well below their current reading grade level. She stated that her integration effort combined the use of a specialized classroom-based reading program and iPad carts, depending on availability. Although Stacy said that she “is not terribly comfortable in her own ability” with regard to technology integration, she still planned for its use when it suited her curriculum (Stacy, observation, October 15, 2015). Stacy said, “I have intensive kids. I have the kids who are pulling up video games and music if you are not watching them, so I am constantly monitoring that they're on task” (Stacy, personal communication, May 19, 2015). Stacy also expressed that she had fewer classroom disruptions with the use of technology, even though she could not say whether it was due to the technology used, or the increased monitoring that took place (Stacy, personal communication, May 19, 2015).

William

William was a white male teacher who taught an elective business course that consisted of both multi-grade as well as multi-level learners. During the interview, I found that William had a great sense of humor as he regularly made jokes about his age, his computer ability, and his good looks. William was very easy to talk with, and his outgoing personality filled the entire room. During the interview, William alluded to the fact that all of his teaching experience had been gained at the secondary level as he had entered the teaching profession after a successful business career. Although he admitted to not having a strong background in technology, he stated that he “gets a lot of help and assistance from his peers” (William, personal communication, August 12, 2015). Even though William considered himself to be at “a low
confidence level” regarding technology integration, he allowed its use within his classroom to get the creative projects done (William, personal communication, August 12, 2015).

During the classroom observation, I witnessed his charisma and witiness as he bantered back and forth with the students. Although William held a low level of technology self-confidence, he did not permit it to hold back his students. William stated that his integration effort primarily consisted of using 10 classroom-based computers on a daily basis. In order to get the most out of his limited number of computers, William said that he divided his students into two groups. He said that he placed the first group on the computers while the other group worked at their seats. The next day, William put the second group on the computers while the original group worked at their seats (William, observation, November 15, 2015). To sum up his beliefs, William adamantly stated that the classroom must “stay contemporary” and that students need to be “working with the same elements that they are going to be using in the future” (William, personal communication, August 12, 2015).

**Linda**

Linda was a white female teacher who held a position as a co-teacher in the ESE environment. During the interview, I noted that Linda was quiet and reserved in the beginning but she opened up and became more exuberant when she spoke about her students. During our conversation, she confirmed that the majority of her teaching experience had come at the secondary level even though she had 17 years of elementary experience. Linda said she had spent time teaching math, science, social studies, reading, and language arts, but revealed that language arts had always been her favorite subject. Linda stated that she often relied on her co-workers and trusted that they had the required experience to guide her to the right technology for her students. Linda also expressed that the use of technology often “gives children an
opportunity to express themselves in ways that they can't always do in a traditional classroom” (Linda, personal communication, May 21, 2015).

During the observation, I documented that she typically entered the regular core classroom as a co-teacher so she could help the low-level learners with their work. Even though she did not have a dedicated room, she said that she worked with specific groups of students each day. During the observation, I noted that Linda moved around the room as she identified the students who needed help. I also noted that she was genuine in her support, and the students valued the time she spent with them. She stated that her integration effort combined the use of school computer labs and iPad carts, depending on availability (Linda, observation, October 2, 2015). Although Linda stated that she “does not have the background that she should have” with regard to technology integration, she said that she still looks for the opportunity to use it within the classroom environment (Linda, personal communication, May 21, 2015).

Because it is important to see the individual differences between group members, the participant demographics are displayed in Table 1.

Table 1

<table>
<thead>
<tr>
<th>Participant Pseudonym</th>
<th>Stacy</th>
<th>William</th>
<th>Linda</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Female</td>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td>Age Group (years)</td>
<td>50 - 59</td>
<td>60 or older</td>
<td>50 - 59</td>
</tr>
<tr>
<td>Years of Teaching Experience (years)</td>
<td>21 - 25</td>
<td>11 - 15</td>
<td>31 or more</td>
</tr>
<tr>
<td>TICS Confidence Score</td>
<td>2.04</td>
<td>2.61</td>
<td>3.25</td>
</tr>
<tr>
<td>Technology Self-Efficacy Level</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
</tbody>
</table>
Joseph

Joseph was a white male teacher who held a position as a co-teacher in the ESE environment. During the interview, Joseph acknowledged that all of his teaching experience had come at the secondary level. Joseph also revealed that he had worked in many different core classrooms, but science had been his favorite subject. During our conversation, I noted that Joseph spoke with a great deal of confidence and that he was able to laugh now and again. Although Joseph considered himself to be “pretty familiar with technology” regarding technology integration, he admitted that “the kids know more about technology these days than we do.” (Joseph, personal communication, May 13, 2015). Nevertheless, he stated that he “tries to convince the teacher to incorporate as much technology as possible” within the prescribed curriculum (Joseph, personal communication, May 13, 2015).

During the classroom observation, I documented that he entered the regular core class as a co-teacher so he could help the low-level learners with their work. Even though he did not have a dedicated classroom, he said that he worked with several specific groups of students each day. As he moved around the room, I observed that he displayed a calm demeanor and that the students valued the time he spent with them. I also documented that Joseph’s presence seemed to provide additional support to the low-level students as he challenged them to stay engaged with the learning objective. Joseph said that his integration effort combined the use of student smartphones and a school iPad cart, depending on availability (Joseph, observation, October 7, 2015).

Terrence

Terrence was a black male teacher who taught an elective reading course that consisted of low-level struggling learners who were below grade level in reading. Terrence stated that he
held a personal goal of getting each student back to their respective grade level in reading. During the interview, I noted that Terrence had an easy-going demeanor, and that he was firm and straightforward with his words. Terrence stated that all of his teaching experience had come at the secondary level. Terrence said that he had taught language arts and reading, but he emphatically stated that working with struggling readers had always been his favorite arena. Additionally, Terrence expressed that he used the available technology in his classroom based on the student’s learning level (Terrence, personal communication, August 11, 2015).

During the classroom observation, I documented that his classroom location was near other elective courses. Terrence said that his integration effort combined the use of student smartphones and iPad carts, depending on availability. Even though Terrence considered himself to be somewhat knowledgeable about technology integration, he still worked hard to incorporate its use into the classroom several times a month (Terrence, observation, October 7, 2015).

**Barbara**

Barbara was a white female teacher who taught an elective health course that consisted of both multi-grade as well as multi-level learners. During the interview, I discovered that Barbara was a bit reserved at first, but she opened up as we discussed technology in the classroom. Barbara stated that the majority of her teaching experience had come at the secondary level, even though she had three years of elementary experience. Over the course of her career, she said that she had taught several different subjects, but health had always been her favorite area. Barbara expressed that “I’m kind of limited because I really don’t know how to use a lot of things. I can easily find websites and different things like that, games and stuff,” but “I only use the things that I know how to use” in my classroom (Barbara, personal communication, August 17, 2015).
During the classroom observation, I noted that Barbara used an LCD projector to show her PowerPoint. After completing the presentation, I watched as she guided the students through a review lesson on an online web site. The students reviewed the material and completed an online worksheet, which Barbara said that she would grade at a later date. Barbara stated that her integration effort combined the use of student smartphones, school computer labs, and iPad carts, depending on availability (Barbara, observation, December 6, 2015). Although Barbara considered herself to be “kind of limited” in her knowledge about technology integration, she planned for its use several times a week (Barbara, personal communication, August 17, 2015).

Clara

Clara was a white female teacher who taught a core science class. She said her class roster consisted of basic as well as advanced level learners. During the interview, Clara admitted that all of her teaching experience had come at the secondary level. Even though she said that she had taught math, science, social studies, and language arts over her career, she admitted that science had always been her favorite subject area. Clara was very friendly and easy to speak to during our discussion. In respect to technology use in her classroom, Clara quickly stated that she used what was available at her school as long as it met her learning objectives for the lesson (Clara, personal communication, May 14, 2015). Although Clara considered herself to be “very familiar with the computer” regarding technology integration, she confirmed that she still spent lots of her own time planning for the effective use of technology within her classroom (Clara, personal communication, May 14, 2015).

During the classroom observation, I noted that her classroom location was in a grade-level team pod where her students rotated between her class and the other core team teachers. While in the classroom, I observed that she had the students’ attention as she explained the
technology activity that they were about to begin. I documented that Clara was firm in her explanation, yet very adept to those who asked questions or sought additional guidance. I also noted that she had a good rapport with her students and that they followed her directions as the formed small groups and began their Internet research. Clara said that her integration effort combined the use of school computer labs and iPad carts, depending on availability (Clara, observation, November 19, 2015).

It is important to see the individual differences between group members, so their participant demographics are displayed together in Table 2.

Table 2

*Participant Demographics*

<table>
<thead>
<tr>
<th>Participant Pseudonym</th>
<th>Formal Study – Average Confidence Score</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Joseph</td>
</tr>
<tr>
<td>Gender</td>
<td>Male</td>
</tr>
<tr>
<td>Age Group (years)</td>
<td>50 - 59</td>
</tr>
<tr>
<td>Years of Teaching Experience (years)</td>
<td>16 - 20</td>
</tr>
<tr>
<td>TICS Confidence Score</td>
<td>3.57</td>
</tr>
<tr>
<td>Technology Self-Efficacy Level</td>
<td>Average</td>
</tr>
</tbody>
</table>

Jessica

Jessica was a white female teacher who taught a core math class. She said that her current class roster was made up of basic as well as advanced level learners. During the interview, Jessica expressed that all of her teaching experience had come at the secondary level. Jessica also said that she had only taught math classes. During our conversation, I noted that
Jessica was very straightforward and to the point. Although Jessica considered herself to be “very knowledgeable” regarding technology integration, she stated that she still had to plan for its use several times a month (Jessica, personal communication, June 3, 2015).

During the classroom observation, I documented that the she had completed the lesson from the day before. Jessica said she had spent time the previous day presenting the process of setting up equations from word problems. During the lesson, I observed her as she presented a word problem on the screen. She then gave the students an opportunity to solve it. Once solved, I noted that the students had to enter their answers into an online application. After the answers had been entered, I observed Jessica as she solved the problem on the front screen using student input. Overall, I documented that her integration effort combined the use of student smartphones, school computer labs, and iPad carts, depending on availability (Jessica, observation, December 10, 2015).

Steven

Steven was a white male teacher who taught an elective technology course that consisted of both multi-grade as well as multi-level learners. Steven said that his classroom had been set up as a school computer lab and that he almost had a one-to-one ratio of computers to students. During the interview, Steven revealed that all of his teaching experience had come at the secondary level. Even though Steven said that he had worked in several different technology-related positions, he expressed that this particular technology course had been his most favorite (Steven, personal communication, June 5, 2015).

During the classroom observation, I observed him move around the room as he made contact with the different level of learners throughout the room. Since his computer lab consisted of multi-grade level students, Steven said that he had students at various stages of
completion. To be successful in his position, Steven said that he had to monitor and help those who needed more guidance. Steven stated, “I'm making sure that I'm above what they're doing as far as what we (the students) are using software and program wise” (Steven, personal communication, June 5, 2015). Steven said his integration effort combined the use of his school computer lab and various technology-related software programs available, depending on the student’s depth of knowledge (Steven, observation, December 3, 2015). Even though Steven considered himself to be “extremely knowledgeable” about technology integration, he still pushed himself to expand his knowledge base so he could challenge his students on a daily basis (Steven, personal communication, June 5, 2015).

**George**

George was a white male teacher who taught a core social studies class. George said that his current class roster consisted of basic as well as advanced level learners. During the interview, I documented that George was a good-humored person, and he used his over-the-top personality to dominate the conversation. George also revealed that all of his teaching experience had come at the secondary level. Even though he said had he taught science and social studies, he adamantly stated that social studies was his favorite subject area. Additionally, George said that technology should be embedded in the classroom so the students could actively use it for learning (George, personal communication, June 4, 2015).

During the classroom observation, I recorded that George had grabbed the attention of every student as he expanded the background story from an online textbook passage that the students had read in class. I observed that George clearly had command of the learning in the classroom as the students paid close attention to what he said and did. George said his integration effort combined the use of the school computer labs and iPad carts, depending on
availability. George expressed an abundance of pride because his students used an online textbook as well as an online discussion board to complete their assignments (George, observation, October 27, 2015). Although George considered himself to be “a power user” with regard to technology integration, he expressed that he still had to push himself to use technology on a daily basis (George, personal communication, June 4, 2015).

Since it is important to see the individual differences between group members, their participant demographics are displayed together in Table 3.

Table 3

<table>
<thead>
<tr>
<th>Participant Pseudonym</th>
<th>Formal Study – High Confidence Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jessica</td>
<td>Steven</td>
</tr>
<tr>
<td>Gender</td>
<td>Female</td>
</tr>
<tr>
<td>Age Group (years)</td>
<td>50 - 59</td>
</tr>
<tr>
<td>Years of Teaching Experience (years)</td>
<td>6 - 10</td>
</tr>
<tr>
<td>TICS Confidence Score</td>
<td>4.04</td>
</tr>
<tr>
<td>Technology Self-Efficacy Level</td>
<td>High</td>
</tr>
</tbody>
</table>

Results

During the analysis, four distinct themes emerged from the participants’ discussions. These themes are listed below in sequential order. The first theme, perceived environment, covers the actual perceived view of the teacher within the integrated classroom. This theme is based on their personal depiction of what was experienced during their technology integration efforts. The second theme, rationale for use, provided insight into how and why decisions are
made as to the type of technology integrated into the classroom. The third theme, development of personal understanding, offered a personal glimpse into the professional growth and training undertaken by a teacher so that they could become more knowledgeable and proficient in the use of technology. The final theme, barriers faced, described the issues faced by a typical classroom teacher as they attempted to use technology within the learning environment. Each theme is discussed in length as it relates to the corresponding guiding research question.

**Theme Development**

I attained the themes for the formal study after a thorough and lengthy review of the individual interview and focus group session transcripts. As I read and reread the transcripts, I considered each statement concerning its intended description of the phenomenon under study. I recorded all relevant statements in a document so the statements could be reviewed and later grouped into meaning units.

For the data analysis, I used the steps of a phenomenological study as prescribed by Moustakas (1994, p.122). As a starting point, I bracketed my personal knowledge and experience concerning technology integration by presenting my personal epoché before the pilot study began. During data analysis, I followed Moustakas’ (1994) prescribed phenomenological steps, whereas I (1) recorded all relevant statements, (2) listed each non-repetitive, non-overlapping statement, (3) grouped statements into meaning units, and (4) synthesized the meaning units into themes. As I analyzed the data, I found several words and phrases that repeated in the transcripts. These words and phrases were grouped and developed into meaning units which were later developed into the themes and sub-themes of the study. I have provided an example of some of the repeated words and phrases in Table 4.
Table 4

Repeated Words and Phrases Mentioned by Participants

<table>
<thead>
<tr>
<th>Repeated Words and Phrases</th>
<th>Data Source</th>
<th>Sub-Theme</th>
</tr>
</thead>
<tbody>
<tr>
<td>All engaged</td>
<td>Interview</td>
<td>Increased engagement</td>
</tr>
<tr>
<td>More engaged</td>
<td>Interview</td>
<td>Increased engagement</td>
</tr>
<tr>
<td>Higher engagement</td>
<td>Focus Groups</td>
<td>Increased engagement</td>
</tr>
<tr>
<td>What I understand/know</td>
<td>Interview</td>
<td>Understandability</td>
</tr>
<tr>
<td>What I can use/operate</td>
<td>Interview</td>
<td>Understandability</td>
</tr>
<tr>
<td>Understand/know it</td>
<td>Focus Groups</td>
<td>Understandability</td>
</tr>
<tr>
<td>(Take) trainings</td>
<td>Interview</td>
<td>Professional Trainings</td>
</tr>
<tr>
<td>(Take) a lot of trainings</td>
<td>Interview</td>
<td>Professional Trainings</td>
</tr>
<tr>
<td>(Take) district trainings</td>
<td>Focus Group</td>
<td>Professional Trainings</td>
</tr>
<tr>
<td>Wi-Fi went down</td>
<td>Interview</td>
<td>Connectivity Issues</td>
</tr>
<tr>
<td>Server problems</td>
<td>Interview/Focus Groups</td>
<td>Connectivity Issues</td>
</tr>
<tr>
<td>Cannot get connected</td>
<td>Focus Groups</td>
<td>Connectivity Issues</td>
</tr>
<tr>
<td>Lack of availability</td>
<td>Interview/Focus Groups</td>
<td>Availability Issues</td>
</tr>
</tbody>
</table>

This process allowed for a thorough review of the collected data so I could start to develop and build a composite textual description of the meanings and essence of the phenomenon under study. According to Moustakas (1994), a composite description captures the dynamic, lived experience in a vivid, clear, and vibrant manner. In addition, the composite description brought the character and dynamics of the phenomenon to the forefront.
Themes

The following themes were synthesized based on meaning units assembled from participants’ transcripts as well as my interpretation and data analysis:

(1) Perceived Environment

(2) Rationale for Use

(3) Expansion of Personal Knowledge

(4) Barriers Faced

The themes, as well as the corresponding sub-themes, are discussed in relation to the research study questions.

Research Question Responses

The research questions are defined and explored through the data collected from the lived experiences of the study’s participants. In addition, the related themes and sub-themes are discussed.

Research question one. *How do teachers define technology integration in today’s secondary classroom?* I designed this question so I could understand the essence of what technology integration means to a secondary teacher. This question also explored how the teacher perceived and defined the classroom. Through the data analysis, the first theme, perceived environment, and its following five sub-themes emerged: (a) increased engagement, (b) enhanced environment, (c) future preparation, (d) student motivator, and (e) student expressiveness. Each sub-theme is listed by participant name in Table 5.
Once the individual interview began, each participant freely shared their experiences, feelings, and thoughts about technology integration and its impact on their instructional activities. The first theme, perceived environment, rendered a picture of the perceptions that a teacher had developed as they integrated technology. This theme was an actual description of what the teacher envisioned within their mind based on their individual experiences within their specific classroom. In addition to the overall theme, there were two sub-themes mentioned more often than the remaining three, future preparation, student motivator and student expressiveness. Each theme and sub-theme will be discussed in length through individual as well as group responses.

The perceived environment was derived through participants’ discussions and was an authentic description of what they perceived the classroom to be as they integrated technology. As an overall starting point, George stated that technology integration “means taking technology
and embedding it in the standards to make sure that the learning goal is met” (George, personal communication, June 4, 2015). Therefore, George had an underlying purpose for the enhancement of his curriculum through the use of technology. Clara stated that “it means the students are actively using the technology” while in the classroom (Clara, personal communication, May 14, 2015). Clara also insisted that technology must be used in the classroom because it does not make sense to have it sit on a shelf. Jessica said, “everything in the world is going technology-based” and therefore, the classroom should reflect it (Jessica, personal communication, June 3, 2015). Steven added to Jessica’s idea as he stated that “it is getting kids more familiar with the technology that they are going to use in college as they go on to college or to the workforce” (Steven, personal communication, June 5, 2015). Steven and Jessica viewed the new classroom as more student-centered because the technology used within it matched what was being used outside in the real world. Joseph summarized this concept as he stated, “I just think it is the new route to go” and our classrooms must have it readily available for the students to use (Joseph, personal communication, May 13, 2015). The perceived environment, as described by the teachers’ who used technology, was a transformation from a teacher-centered classroom into a more student-focused environment as defined by the following supporting sub-themes.

**Increased engagement.** Increased engagement was the only sub-theme mentioned by all 10 participants (Focus Group, personal communication, December 14, 2015, December 15, 2015, & January 9, 2016). Thus, in the eyes of the participants, the technology used piqued the curiosity of the students within the classroom. William stated, “it has been way less challenging to get that low student to work. They like being on the computers. No question” (William, personal communication, August 12, 2015). Additionally, William added, “when they are on
their computers or things like that they seem to be all, almost, all the time engaged with they are supposed to be doing” (William, personal communication, August 12, 2015). In most instances, the participants viewed technology as the spark that was required to grab the students’ immediate attention and keep them involved. Joseph stated, “To me, I think that students are more engaged with technology (Joseph, personal communication, May 13, 2015). Jessica echoed the same sentiment by stating, “The students are much more engaged” when using technology (Jessica, personal communication, June 3, 2015). Barbara added, “Yeah, engagement. Much more, higher student engagement” with the use of technology (Barbara, personal communication, August 17, 2015).

As I listened to the participants, they agreed that they were much more likely to use technology again after witnessing the increased student engagement. Terrence stated, “It is a very good learning tool. The kids definitely respond better to the use of technology…usually they are all engaged” (Terrence, personal communication, August 11, 2015). Linda summarized this concept by saying, “We do not have very many students off task. Everybody is doing what they (the students) are supposed to be doing. I think it is awesome to have 100% engagement in the classroom” (Linda, personal communication, May 21, 2015). Since the addition of technology increased student engagement, it made the enhanced learning environment more inviting and much easier to participate in for the student.

*Enhanced environment.* The enhanced environment has not been seen in a traditional classroom, because it supports the student in both delivering and reinforcing the content. George and Stacy were adamant about the use of technology in the classroom as Stacy said the “kids are using it independently or at least learning the processes to utilize the applications independently” (Stacy, personal communication, May 19, 2015). In addition, Stacy stated that “it lets them
experiment and learn how to use the technology so that they are developing some independent skills in technology” (Stacy, personal communication, May 19, 2015). Once the learning environment has become more student-focused, the emphasis can be changed and aimed at enhancing the learning process. In fact, you could feel the passion in George’s voice as he summarized the concept:

It has to be relevant to what they (students) are doing for what the end result will be. If you are assessing them on a certain skill or a certain competency related to the next generation standard, it has to be relevant to what you are doing...if I want them to explain something related to the Judaic religion that we are currently studying and I want them to summarize it in their own words, I would make sure that they could do that with the technology piece that I choose. Whether it is a presentation, a Podcast, or a discussion board post. (George, personal communication, December 15, 2015)

Several of the participants said that the integration effort must be embedded as an enhancement piece and used actively by the students instead of just once a quarter in a computer lab. Clara reinforced this idea as she stated they are using technology “to hopefully create or research or enhance their learning” (Clara, personal communication, May 14, 2015).

During the focus group sessions, nine of the participants agreed and stated that when technology is added to the classroom, there should be a similar enhancement to the learning environment (Focus Group, personal communication, December 14, 2015, December 15, 2015, & January 9, 2016). The average confidence level focus group summarized the enhanced environment sub-theme the best as the participants said, “it is students using technology…it is students learning from technology…it is students producing a more enhanced product for their assignments” (Focus Group, personal communication, January 9, 2016). Even though the
technology used, as stated by the participants, could be either classroom or student-focused, it still needed to be matched to a specific learning objective (Focus Group, personal communication, December 14, 2015, December 15, 2015, & January 9, 2016).

**Future preparation.** This sub-theme works in conjunction with the enhanced environment sub-theme because the students will be using modern technology in the classroom as well as throughout their lifetimes in the workforce. Terrence stated that technology integration “means getting the students used to or accustomed to using technology effectively” (Terrence, personal communication, August 11, 2015). Adding to this thought, William said that the classroom must “stay contemporary” and that students need to be “working with the same elements that they are going to be using in the future” (William, personal communication, August 12, 2015). If you look around, it is very difficult to find someone who has not incorporated technology into daily life. Steven added to the idea by stating that “it is getting them ready for what is being used in the workplace today” (Steven, personal communication, June 5, 2015).

In other words, the enhanced learning environment has quickly become a place for student exploration and experimentation since the classroom can provide the necessary training and exposure to technology needed for success in the future. Joseph summarized this concept as he stated, “it is the way to go…there is a lot of technology out there that we are not even aware of” (Joseph, personal communication, May 13, 2015). As described by several participants, the use of innovative technology effectively placed the enhanced learning environment in line with today’s modern technology test labs, so what was used in the classroom has trained the students for the future possibilities (Focus Group, personal communication, December 15, 2015 & January 9, 2016). Thus, classroom teachers who integrate technology today have equipped
students to succeed in the world of the future.

**Student motivator.** With the addition of technology, the classroom has been changed to a more student-centered model where the student has taken greater responsibility for their individual learning (An & Reigeluth, 2011). Standing at a podium and lecturing is too often the case in a traditional classroom where the teacher is the focal point and all learning moves through them (Inan & Lowther, 2010b). Barbara stated that “it (technology) keeps the kids more interested and motivated than if you are just standing there and lecturing” (Barbara, personal communication, August 17, 2015). Students can now learn from a variety of technology tools such as computer-based programs and interactive websites. Joseph stated that “the kids know more about technology these days than we do,” so it is only natural “to incorporate as much technology as possible” within today’s classroom (Joseph, personal communication, May 13, 2015). The technology used in the classroom may have bridged the gap for some teachers. Linda stated that the “kids that are not motivated tend to be more motivated when they have technology at their fingertips” (Linda, personal communication, May 21, 2015). Linda’s statement showed that technology use might be the teacher’s carrot needed to get some students involved.

The high confidence group said that the technology used in the classroom must be engaging to the student because they will quickly lose interest and move on to something else that catches their attention (Focus Group, personal communication, December 15, 2015). Jessica stated that the students are “much more engaged when they are doing hands-on things than they are with just watching us doing examples, and then getting work done” (Jessica, personal communication, June 3, 2015). In addition, Jessica stated that she “had kids who were not engaged at all during the year, but when they did this (technology-based) project they excelled”
(Jessica, personal communication, June 3, 2015). You could hear the delight in Terrence’s voice as he stated, “with technology, it allows them (the students) to work at their own pace without writing by hand and making errors…the mistakes, which would affect their self-confidence. It enables kids to be more confident as they do work” (Terrence, personal communication, August 11, 2015). Steven summarized the sub-theme as he stated:

> It is neat to see their excitement in the classroom when they use the technology…it is really something special. Especially when they make really outstanding projects, and they go above what was expected, and they do more than they were told to do. (Steven, personal communication, June 5, 2015)

Steven’s final thought was that if they (the students) are given technology in the classroom, they (the students) will exceed our expectations (Steven, personal communication, June 5, 2015).

**Student expressiveness.** According to several participants, the use of technology has been an effective learning conduit for some students. Linda stated that some technology “gives children an opportunity to express themselves in ways that they cannot always do in a traditional classroom” (Linda, personal communication, May 21, 2015). Instead of turning in a five-paragraph essay, a student could be allowed to turn in a 10-slide presentation. You could hear the excitement in her voice as she stated that her “ESE kids really thrive when you give them a piece of technology to use” (Linda, personal communication, May 21, 2015). In fact, while using a presentation program, Linda stated:

> I was concerned that some of my students would not be able to take the information from the textbook, summarize it, and then add all pictures within the same time frame the other students were able to do it in. I was surprised to see that they actually could do it, and they enjoyed it, and they picked up on it really quickly. (Linda, personal communication,
Linda expressed, if used in the right situation, technology could be beneficial for the student. Jessica stated that she “had them (the students) do a little video, with bringing in pictures and copies and uploading links for to videos…which they were able to use to teach your classmates” (Jessica, personal communication, June 3, 2015). She added that the students had exceeded her expectations and that the videos were quite good. George summarized this sub-theme by stating:

Last year, when I had my kids create web pages, and I gave them a rubric for my expectations. I did not expect them to go above this rubric and one of them did extremely well. She went to Tallahassee to represent us. She did an amazing job with her project. (George, personal communication, June 4, 2015)

The low confidence focus group stated that if given the opportunity to express themselves, some students will go above and beyond and exceed well-intended expectations (Focus Group, personal communication, January 9, 2016).

**Research question two. How do teachers make decisions about the type of technology to use in their secondary classroom with regard to their level of technology self-efficacy?** I designed this question so I could understand how technology was selected and integrated by a secondary teacher. This question also explored how a secondary teacher gained the required knowledge needed to use a specific technological device and/or application within his or her classroom. Through the data analysis, the second and third themes emerged, rationale for use and expansion of personal knowledge. In addition to the two main themes, the following seven sub-themes emerged: (a) understandability, (b) school-supplied technology, (c) meets needs, (d) recommended by others, (e) professional training, (f) individual research and practice, and (e) help from others. Each sub-theme is listed by participant name in Table 6.
The second theme, rationale for use, offers insight into the how and why specific technology was selected for a classroom environment. Understanding why technology was used or not used was critically important because the administration, teachers, and students had a vested interest in the outcome. Gaining insight into this theme could benefit the entire educational community.

As a frame of reference, the focus groups stated that technology integration was not a forced requirement in their classroom, even though it did appear on the teacher’s evaluation form (Focus Group, personal communication, December 14, 2015, December 15, 2015, & January 9, 2016). With this in mind, a teacher could have embraced technology just to complete a check box on the evaluation form.

**Understandability.** Understandability was a simple concept because if a teacher knew how it worked, he or she used it. The real difficulty came through the gaining of knowledge needed to use a particular piece of technology. Eight of the 10 participants stated that a teacher needed a basic understanding of the technology before the actual use of it in the classroom.

<table>
<thead>
<tr>
<th>Participant Pseudonym</th>
<th>Low Confidence Level</th>
<th>Average Confidence Level</th>
<th>High Confidence Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>William</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Linda</td>
<td></td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Stacy</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Joseph</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Clara</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Terrence</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barbara</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jessica</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Steven</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>George</td>
<td></td>
<td></td>
<td>x</td>
</tr>
</tbody>
</table>

*Table 6

Rationale for Use: Sub-themes by Participant*
Joseph firmly stated, for him “right now it’s what I understand and can operate,” since “what I understand I can bring to the classroom” (Joseph, personal communication, May 13, 2015). Jessica stated, “I make sure that I totally understand them (programs) before I use them with the kids” (Jessica, personal communication, June 3, 2015). Understanding how the technology worked seemed to be a common thread throughout the participants in the study. Most participants wanted to test the technology before using it with students (Focus Group, personal communication, December 14, 2015, December 15, 2015, & January 9, 2016). Barbara expressed that she was limited in her understanding and that she only used technology in her classroom that she understood (Barbara, personal communication, August 17, 2015). Stacy added that “I just don't know the technology well enough to say, oh, this is the way that I can use it” (Stacy, personal communication, May 19, 2015). Again, Barbara and Stacy only used a technology piece because it was familiar to them. George adamantly concluded that he chooses “what is relevant” as well as “something I can build upon” (George, personal communication, June 4, 2015). He confidently added that he wants to “take the technology to the next step” (George, personal communication, June 4, 2015).

**School-supplied technology.** School-supplied technology was also a simple concept because if it was available to be used at the school, many teachers used it. The problem occurred when everyone wanted to use the school-supplied technology at the same time and there was not enough technology to cover the entire school, or there was a specific technology piece that could be used, but it was not owned nor available to use at the school. William spoke with frustration as he stated, “unfortunately, all I use is what is available to me…it has really just been a few computers and the Internet through their cell phones” (William, personal communication, August
William stopped joking long enough to say “I am an old guy. A lot of this is new to me, and I would not be able to use an iPad cart even if it was provided for me because I do not know how to incorporate iPads into my curriculum” (William, personal communication, August 12, 2015). Stacy also spoke with a bit of frustration as she explained:

Since we are an elective reading course, we get the oldest equipment. We had 16 computers, and, you know, some of them, had the keys would fall off. You know, it was hard to connect, and some of them were old and archaic, it would take like ten minutes to warm up, so we never shut them down, except on Fridays because it took so long for them come back on. (Stacy, personal communication, May 19, 2015)

Since her class was given 16 computers, she used them even though they were old and on their way out. Stacy said that she was always placed at the bottom of the iPad cart list because she had computers in her class and most other classes did not (Stacy, personal communication, May 19, 2015). Again, William and Stacy used what the school-supplied for them since it was very difficult to get any new or updated equipment. Stacy summarized this sub-theme by stating that she “didn’t grow up with it” and that “it makes me a little nervous to experiment with it,” which means she only uses what the school has available if she understands it (Stacy, personal communication, May 19, 2015). Overall, several participants said that the teachers used the school-supplied technology if it was available when they needed it.

Even though whiteboard use was only mentioned in one focus group, it is important to note that the average confidence focus group stated that there were numerous whiteboards (smartboards) no longer in use. Although this technology was available for use in the classroom, the focus group stated that the whiteboard use had dropped due to equipment issues. Joseph stated that his school “had 12 whiteboards that just sit in the media center and do nothing”
(Focus Group, personal communication, January 9, 2016). Clara added, “it is the software. Unfortunately, the hardware is still there, but the software...(pause) is outdated” (Focus Group, personal communication, January 9, 2016).

**Meets needs.** Although this concept was comparable to the first two sub-themes, it did go a step further, since the teacher matched a need in the classroom to a specific technology being used. Clara stated that she used a “piece of technology that's available and that's going to suit the needs of the learning objective” (Clara, personal communication, May 14, 2015). Several participants stated that if the technology available did not align to the learning objective, it would not be used for that lesson. Linda stated that she “collaborates with the basic education teachers to figure out what’s best for all of our students,” so she can match the needs of the students to the technology being used (Linda, personal communication, May 21, 2015). Like Linda, most teachers used technology because there was a benefit for the learning environment. Jessica stated that “if it (the technology) is applicable to what I am teaching, I am going to use it” (Jessica, personal communication, June 3, 2015). In addition, Terrence expressed that he used the available technology based on the student’s learning level (Terrence, personal communication, August 11, 2015). Joseph chimed in during his focus group and firmly stated that he “match the technology to the outcome” and if it did not match, it was not used (Focus Group, personal communication, January 9, 2016). George summarized this sub-theme by stating that the teacher had to consider many things, “but most importantly, the technology used had to relevant to the chosen activity” so the learning outcome could be achieved by the students.

**Recommended by others.** The last sub-theme recommended by others suggested that a teacher would select technology based on a recommendation of their coworkers. Previously, Linda mentioned that she had conferred with her peers before selecting a technology to use
Linda, personal communication, May 21, 2015). Collaboration with peers was important to Linda since she had ESE students and did not know if the available technology would not be appropriate for their specific use (Linda, personal communication, May 21, 2015). Linda relied on her co-workers and trusted that they had the required experience to guide her to the right choice for her students (Linda, personal communication, May 21, 2015).

Four of the 10 participants stated that they relied on the input of others when they selected a technology to use. The low confidence focus group stated that they sought help when making decisions about which technology to use. Stacy said that she “usually relies on other people’s recommendations” (Stacy, personal communication, May 19, 2015). In addition, Stacy stated that she relied “on other people’s success” because if it worked for them, it might work for her as well (Stacy, personal communication, May 19, 2015). William mentioned that he “got help from his peers before starting a new program” because he did not want to waste time trying it if it did not work for someone else (William, personal communication, August 12, 2015). Jessica summarized this concept as she stated, “I also work with one of my colleagues here at the school who is extremely knowledgeable about the different apps” that can be used in the classroom (Jessica, personal communication, June 3, 2015). Even though some teachers need to have extensive knowledge of the technology being used, Stacy, William, and Jessica are satisfied with reaching out to their co-workers to get something that would work for them.

Understanding how teachers learn about technology used in the classroom is important because it provides an effective pathway for future state, district, and school-based professional development. In addition, the understanding gained might allow a better allocation of resources so professional development can be designed to fit the teacher’s needs instead of what the stakeholder wants to provide. Knowing how to get the knowledge required for technology
integration in the hands of the teachers could be vital to the successfulness of any professional development program. The third theme, expansion of personal knowledge, was extremely important to all three focus groups. The third theme and its three sub-themes are listed by participant name in Table 7.

Table 7

*Expansion of Personal Knowledge: Sub-themes by Participant*

<table>
<thead>
<tr>
<th>Participant Pseudonym</th>
<th>Low Confidence Level</th>
<th>Average Confidence Level</th>
<th>High Confidence Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professional Training</td>
<td>William x Linda x Stacy x Joseph x Clara x Terrence x Barbara x</td>
<td>x x x x x x x x x x x x x x x x x x x</td>
<td></td>
</tr>
<tr>
<td>Individual Research and Practice</td>
<td>x x x x x x x x x x x x x x x x x x x</td>
<td>x x x x x x x x x x x x x x x x x x x</td>
<td></td>
</tr>
<tr>
<td>Help from Others</td>
<td>x x x x x x x x x x x x x x x x x x x</td>
<td>x x x x x x x x x x x x x x x x x x x</td>
<td></td>
</tr>
</tbody>
</table>

The third theme, expansion of personal knowledge, offered insight into the approaches that a classroom teacher used to increased their technological knowhow. Over the last few decades, the educational community has spent large amounts of money on professional development as the main channel for the introductions of new policies, teaching approaches, and/or methods of improving classroom instruction using technology (Wise & Rothman, 2010). Beach County, like many other districts, expected their teachers to attend district-based professional training when required at the district office or their assigned school. The focus groups stated that they were expected to attend professional training anytime there was a change in programs used throughout the county (Focus Group, personal communication, December 14, 2015, December 15, 2015, & January 9, 2016). In fact, the school district had just rolled out a new training program during the first few months of the new school year (Focus Group, personal
Professional training. Professional training is a method used by state and local districts to develop their instructional staff. Barbara stated that she “had not made it to many of the trainings that we (district) had because most of the time, they have the trainings on the days that we have our (PLC/department) meetings” (Barbara, personal communication, August 17, 2015). Although she could have benefited from the additional technology training, Barbara did not attend because she was also required to attend a school-based meeting. Even though Barbara missed several trainings this year, she still stated that she would go if they offered them again (Barbara, personal communication, August 17, 2015). William, Linda, and Stacy stated that they had all attended a recent training. When asked if the training fit their needs, William stated, “it did” in a roundabout way but expressed he “needed more one-on-one training” (William, personal communication, August 12, 2015). Linda also chimed in and stated that “the training was good,” but stressed that she “felt like she still needed more training” (Linda, personal communication, May 21, 2015). Stacy also said that “the training had helped her,” but she “needed more time to work on what she learned” (Stacy, personal communication, May 19, 2015). Additionally, both George and Terrence both stated that they had attended a lot of personal development training. George confidently said that it was one of the best ways to increase your knowledge (George, personal communication, June 4, 2015; Terrence, personal communications, August 11, 2015).

In fact, seven of the 10 participants from the formal study stated that they had attended some form of a district or school-based training within the last year. Although this is a majority of those who participated in the study, six of the seven participants who attended training came from the either the low and the average confidence groups. The high confidence group, on the
other hand, had only one member who attended a district training. It seemed that those with a lower technology confidence level appeared more inclined to attend a technology-themed training when compared to those who held a higher technology confidence level.

**Individual research and practice.** This sub-theme showed that many teachers like to research and practice what they had learned so they could become more comfortable with what they had used. Steven stated, “I'm making sure that I'm above what they (the students) are doing as far as what we (the students) are using software and program wise” (Steven, personal communication, June 5, 2015). Steven also added that he stays ahead of the students “by going ahead and doing all the projects that we (the students) are supposed to do before the students get to it” (Steven, personal communication, June 5, 2015). In fact, he expressed “I'm doing it, six months to a year, ahead of what they are doing” in the classroom (Steven, personal communication, June 5, 2015). Although some teachers favored a trial run before using it in front of the entire class, Steven was the exception as he did all the student assignments before he actually taught the course (Steven, personal communication, June 5, 2015). Linda stated, “I need to take a more active part in presenting and using the technology with the students,” which means, for me, “I have to be interacting with that technology and practicing it” before using it in class (Linda, personal communication, May 21, 2015). While a few teachers admitted that the students know more than they do, the vast majority still operated under the old axiom; practice makes perfect. The use of the axiom meant that teachers still felt the fundamental need to have a better understanding about what they are using in the classroom.

Even though some teachers are willing to work on important items during their off-duty time, Joseph stated, “I sit at home all night long and research stuff online myself” (Joseph, personal communication, May 13, 2015). Joseph also expressed that “everything has been self-
taught” as opposed to attending district-sponsored professional training (Joseph, personal communication, May 13, 2015). Terrence added to this notion by stating, “I’ve also done my own personal research about new products and technologies” (Terrence, personal communication, August 11, 2015). Both Joseph and Terrence have directly increased their understanding of technology integration through their own personal efforts (Joseph, personal communication, May 13, 2015; Terrence, personal communications, August 11, 2015).

Although professional development was the important mode of learning about technology in their district, many teachers added to their knowledge and understanding by conducting their own additional research at home. In fact, three of the four participants who did individual research were from the high confidence group, which meant those who had a better foundation were more inclined to do supplemental research on their own. George summarized this overall concept as he stated, “my individual research generates more ideas that I can take and use in my own classroom” (George, personal communication, June 4, 2015).

**Help from others.** This sub-theme showed that teachers are willing to get help from their co-workers. Like many teachers, William had reached out to others to gain a better understanding of how technology can be used within the classroom (William, personal communication, August 12, 2015). William laughed as he stated, “I am a dinosaur and if I am going to get something out of this…I need help and assistance from my peers” (William, personal communication, August 12, 2015). Likewise, Linda stated, “I take the opportunity to learn from people that are around me” (Linda, personal communication, May 21, 2015). It is evident that many teachers reach out to those around them who have more knowledge. In fact, Barbara summarized this concept as she stated, “I do work with the ICT coach every now and then, in trying to learn different things” so it can be used in the classroom (Barbara, personal
communication, August 17, 2015). Although some teachers like to hold a thorough knowledge of what they are using, others are just as happy to reach out to their co-workers for help.

Even though many of the participants said that they shared their knowledge with their peers, it is important to know that the high confidence focus group stated that they did not always share their successes right away (Focus Group, personal communication, December 15, 2015). George said that he used a technology piece until he felt comfortable with it (George, personal communication, June 4, 2015). Once he felt comfortable with it, he said he used it as much as possible before he shared it with others. Jessica and George both said that once it was shared, everyone used it across the school (Focus Group, personal communication, December 15, 2015). After the majority of the school had used the technology piece, Jessica and George said that they noticed that the students had become less interested with that specific technology piece. In addition, George stated that he always had a new technology piece ready to use before he shared the one that had been successful (Focus Group, personal communication, December 15, 2015).

**Research question three.** How does the teacher’s individual level of technology self-efficacy impact the application of technology used within the secondary classroom? I designed this question so I could understand the impact of technology integration within a secondary classroom. This question also explored the success and/or failures of the teacher as technology integration took place in the classroom. Through the data analysis the final theme, barriers faced, and its following four sub-themes emerged: (a) connectivity issues, (b) equipment issues, (c) availability issues, and (d) personal knowledge. Each sub-theme is listed by participant name in Table 8.
Table 8

<table>
<thead>
<tr>
<th>Participant Pseudonym</th>
<th>Connectivity Issues</th>
<th>Equipment Issues</th>
<th>Availability Issues</th>
<th>Personal Knowledge</th>
</tr>
</thead>
<tbody>
<tr>
<td>William</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Linda</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Stacy</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Joseph</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Clara</td>
<td>x</td>
<td></td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Terrence</td>
<td></td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barbara</td>
<td></td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jessica</td>
<td></td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Steven</td>
<td></td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>George</td>
<td></td>
<td>x</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The final theme, barriers faced, presented the roadblocks encountered by a teacher as they attempted to integrate technology into the classroom. This theme easily brought out all the participant’s frustrations. As each participant shared their story, it was evident that they had a similar ending, a well-planned lesson that failed due to an issue that was beyond the teacher’s control (Focus Group, personal communication, December 14, 2015, December 15, 2015, & January 9, 2016). At this point, it is important to recognize that these barriers fall into two broad categories, those controlled by the administration and those controlled by the teacher. The administration controlled the first three sub-themes: connectivity, equipment, and availability issues, while the teacher controlled the final one: personal knowledge. Even though an individual teacher cannot ultimately fix an administratively controlled barrier, these barriers must be discussed because they often lead to teacher frustration and the non-use of technology (Focus Group, personal communication, December 14, 2015, December 15, 2015, & January 9, 2016). As a participant group, each teacher stated that they been impacted by some type of administration-controlled roadblock while using technology within their classroom (Focus

**Connectivity issues.** Eight of the 10 participants from the study mentioned that they had experienced a connectivity issue (Focus Group, personal communication, December 14, 2015, December 15, 2015, & January 9, 2016). Clara became annoyed as she stated, “it is difficult to use technology in the classroom when the Wi-Fi is down” (Clara, personal communication, May 14, 2015). George stated, “there were network issues at the beginning of the year” which prevented him from using an online website as a review tool within his classroom (George, personal communication, June 4, 2015). Joseph voiced his displeasure with the school’s network as he added, “when the Internet crashes…they (the students) get turned off right away” and “their engagement is just out the window” (Joseph, personal communication, May 13, 2015). In addition, Terrence shook his head as he added, “I did not have enough bandwidth to accommodate the lesson that I was trying to teach” (Terrence, personal communication, August 11, 2015). Although frustrating for a teacher, a connectivity issue was a district infrastructure problem that impacted the teacher and the students. You could feel the irritation in Terrence’s voice as he discussed his latest connectivity problem (Terrence, personal communication, August 11, 2015). Terrence stated that students were excited about using technology today, but when the server went down, they quickly lost interest and focus, and the lesson became a waste of time (Terrence, personal communication, August 11, 2015). Even though the teacher had no control over the network issue, they still must be aware of the network viability throughout the day because valuable class time could be wasted while troubleshooting a network problem.

**Equipment issues.** An equipment issue can range across a wide spectrum, such as having an actual equipment failure to attempting to use an outdated program. Although it is important to identify, it is ultimately the same because it results in the loss of valuable class time. William
stated, “I just have difficulty when I hit a snag on how to get out of it smoothly without taking too much class time” (William, personal communication, August 12, 2015). In addition, William also stated, “I have limited computer access, and I have had problems getting them up and running” (William, personal communication, August 12, 2015). Stacy’s frustration boiled over as she stated:

My Apple TV would not come back up, so I could not put the program back on…. I would keep turning off the Bluetooth and turning it back on. Turning the Apple TV off and on. I ended up having to write it (the lesson) on the regular classroom whiteboard by hand for each class because it would take at least half a day before I could get the Apple TV to come back up. You never know if you were going to have it or not have it, which makes it hard and it’s frustrating. (Stacy, personal communication, May 19, 2015)

Stacy is not alone because Clara stated she was frustrated as she had problems when she used the older iPads (Clara, personal communication, May 14, 2015). Although Clara could use them, some programs on the iPads “were outdated and could not be used” even though they still appeared on the touchscreen (Clara, personal communication, May 14, 2015). Steven added that he experienced a problem “when I had a couple of computers that had Microsoft 2013, instead of Microsoft 2010 on it, and to use the program, we needed to use the 2010 version” (Steven, personal communication, June 5, 2015). Furthermore, Stacy, Linda, Clara, and Barbara strongly recommended that teachers have a backup plan ready to use at all times because preparation made the down time more productive than just sitting there (Focus Group, personal communication, December 14, 2015 & January 9, 2016)

**Availability issues.** Although this issue can be reflected in what the school has available to use, it essentially went a bit farther and addressed the actual use that a teacher has. This
concept was most evident during the state and district testing windows. During this timeframe, the site-testing administrators took all the equipment that could be used for student testing (Focus Group, personal communication, December 14, 2015, December 15, 2015, & January 9, 2016). Effectively, this puts all equipment that is normally used in the classroom in off-limit status. Joseph summarized the issue for everyone as he stated:

    Every single laptop and computer that we have in this whole school is gone for testing, so we have no mobile carts…we have tons of mobile carts, but can’t use them because every department had to give them up for testing, testing, and more testing…from March on, we don't get to use technology because everything is being used for testing. (Joseph, personal communication, May 13, 2015)

Seven out of the 10 participants in this study mentioned a loss of use during the mandated testing window (Focus Group, personal communication, December 14, 2015, December 15, 2015, & January 9, 2016). Once technology use was limited to a specific timeframe, the struggle to use it became more difficult for the teachers (Focus Group, personal communication, December 14, 2015, December 15, 2015, & January 9, 2016). Although four of the 10 participants mentioned that smartphones were used in their classrooms, these devices were mainly used for augmenting the school-supplied technology, independent research, or content review activities.

    Since this district has stated that they are working toward a one-to-one computer to student ratio, it is easy to concede that the average school does not possess a class set of computers for each teacher. For example, the focus groups said that iPads are extremely popular technology item in the secondary setting and are typically distributed by mobile cart. These carts usually match class size limits, which place about 25 or so iPads in each cart (Focus Group, personal communication, December 14, 2015, December 15, 2015, & January 9, 2016).
William’s school has six iPad carts that are shared among 48 teachers (William, personal communication, August 12, 2015). Since each grade level has 16 core teachers, two carts could cover eight different teachers. If four sixth grade teachers wanted to use the iPad carts on the same day, there would be a problem (William, personal communication, August 12, 2015). William’s experience was not alone because the availability issues ranged from the iPad carts are all reserved to the laptop cart did not charge all the laptops and half of them are dead (Focus Group, personal communication, December 14, 2015, December 15, 2015, & January 9, 2016).

**Personal knowledge.** This sub-theme is directly under the control of the teacher. If a teacher had specific knowledge of a certain technology piece, they correspondingly had a higher possibility of being familiar with its use. Joseph stated:

> I like to think that I’m pretty familiar with technology and how to run programs and different things, such as spreadsheets, and stuff like that…our biggest thing right now is the Kahoot game, it is for reviewing…it actually caught on and even the older teachers are finally understanding how to use it and put it together and make it go.  

(Joseph, personal communication, May 13, 2015)

Likewise, George stated, “I like to use Keynote with my kids for summarization” and “I like to use Weebly for website creation” (George, personal communication, June 4, 2015). Since these teachers are familiar with their respective programs, they could use them more often in their classroom. Holding personal knowledge about a particular program normally meant it was used more often by that specific teacher. Clara stated, “we started to use Kahoot as a way to review” and “it has been very productive so far” (Clara, personal communication, May 14, 2015). Subsequently, once a teacher found a program that they liked, it would be used whenever they needed it.
If a teacher felt comfortable with a piece of technology, then they would use it accordingly within their classroom. Stacy stated, “I’m not terribly comfortable with most technology,” so she only uses what is straightforward and uncomplicated to her (Stacy, personal communication, May 19, 2015). Additionally, Stacy said that “every time you learn something, it changes and you have to learn it over again” (Stacy, personal communication, May 19, 2015). Steven added, “getting familiar with everything was the biggest barrier” to using technology within his classroom (Steven, personal communication, June 5, 2015).

Although several teachers had stated that they were not familiar at first, several others said once they were comfortable with it, it became easier to use. William, a member of the low confidence group, stated “it seems to become easier as time goes by, not harder” (William, personal communication, August 12, 2015). On the other hand, George, who is a member of the high confidence group, stated, “I’m willing to learn anything new….so I can spice up the curriculum, which can sometimes be kind of boring” (George, personal communication, June 4, 2015). Although these teachers are at opposite ends of the spectrum regarding technology integration confidence, each expressed the willingness to use technology within their comfort level. It is important to note that the participants of this study normally used what they were familiar with unless they possessed a higher degree of confidence in that specific area.

Summary

This chapter contains the insight into the lived experiences of 10 secondary teachers as they integrated technology within their respective classrooms. Through the use of individual interviews, classroom observations, and participant focus groups, four main themes emerged: (a) perceived environment, (b) rationale for use, (c) expansion of knowledge, and (d) barriers faced. Each major theme consisted of several sub-themes that helped to convey the undying idea and
foundation of understanding for the three guided research questions used in the study. The first theme, perceived environment, offered a view into the actual classroom setting as the technology was introduced and implemented.

As the participants shared their stories, the understanding and meaning of technology integration came into focus as they provided their specific visions. The participants said that their perceived environment was student-focused and that the technology used met the learning objectives or the standards for the curriculum. Every participant in the study said that the use of technology increased student engagement. Several participants added that the classroom was enhanced once technology was integrated because the students could process content and work independently. The focus groups also said that the classroom had been enhanced by technology because it allowed for improved quality and better overall student work.

In addition, the participants said that technology prepared the students for the future because they used the same technology in the classroom as they would use in a future workplace. Several participants also said that technology increased student motivation since the technology used in the classroom was like what they used in their daily lives. The focus groups reinforced this notion as they said that the classroom allowed for student exploration. According to the participants, the classroom was set up like a training lab so the students could experiment as well as train in areas of individual interests. Besides providing new opportunities for exploration, the technology used also gave the students an opportunity to articulate their understanding in new and innovative ways. According to several participants, the enhanced classroom allowed the students to go above and beyond their expectations. Many teachers were amazed at the creativity of the students since the technology used afforded more options than they had originally planned for the assignment.
After the participants shared their vision of the classroom, they offered insight into why they used it. Their shared experiences helped to form an understanding of the second research question as the following themes emerged, rationale for use, and expansion of personal knowledge. The most common reason given for technology integration was that the participants had already understood how it worked. The participants said that they wanted to know how to use the technology before using it with the students. This notion gave the participants greater confidence in their ability to be successful with its use. According to the focus groups, if they understood it, they would use it when it met their needs.

The participants also stated that they used the technology supplied by their school if it was available and that it met their learning objective. The participants stated that they did not go out and get their own technology to use in the classroom. Meeting a specific need or objective was paramount for many in the study since the participants said they did not use technology just because it was there. Even though most participants needed an understanding before using it, several participants said they used technology because it was recommended by their peers. The focus groups confirmed this notion as they said it was important to know that others were successful with the same technology.

The third theme, expansion of personal knowledge, focused on how the participants gained and shared their knowledge of technology integration. Many of the participants said that they gained an understanding of technology by attending a school or district offered training. Although trainings were stated as a common method of learning, a few participants said that it was either inconvenient or not aligned to their depth of knowledge. Besides trainings, several participants said that they gained additional knowledge through individual research and practice. These participants said that they went on the Internet and found new things to use in their
classroom. Even though new technology was found, the participants said that they wanted to practice using it before using it with the students in the classroom.

In addition, several participants indicated that they did not have the knowledge or ability to do research and practice at home. These participants sought help from others. The focus groups reinforced this notion as they said they could get help from their peers as well as others on campus. The low confidence group members said that they had an ally that they could turn to if they needed help.

The final theme, barriers faced, gave insight into the impact of technology integration. The participants shared their successes and failures as they discussed what they faced when they used technology in the classroom. The participants said they were impacted the most by connectivity issues. The server went down, the Wi-Fi went down, and the Internet went down were common threads stated over and over. In addition to the connection being lost, several participants encountered equipment issues, such as outdated programs and equipment that just did not work. Another issue of importance was the availability of the school-supplied technology. According to the participants, the technology was difficult to obtain because it was often signed out to someone else. The participants also said that even if they used it on a few occasions during the beginning of the year, it was impossible to use it the end of the year because of the state and district testing. The focus groups confirmed this notion as they stated that everything was taken for testing. It did not matter if you regularly used it, the laptops and iPads carts were repositioned for testing purposes.

Although only mentioned by a couple of participants, it is important to note two outlying topics that were brought into the open: (a) additional school-supplied equipment that was not used and (b) knowledge that was held back and not shared by high confident users. There were
numerous whiteboards (smartboards) that were no longer in use. Even though this technology was available for use, the low confidence group said it was not used because of equipment issues. Effectively, large numbers of these whiteboards were just sitting around not being used because of outdated software or connectivity issues. Even though many participants said that they shared their knowledge with their peers, a few did not share until they had a replacement technology piece. The high confidence group simply said that once it was shared and used by everyone, it quickly became overused and was no longer effective for them.

The next chapter will include a summary of the findings, a discussion of the findings as related to the theoretical framework and reviewed literature, the implications of the study, the delimitations and limitations, and the recommendations for future research.
CHAPTER FIVE: CONCLUSION

Overview

The goal of this study is to gather insight into the lived experiences of secondary teachers while integrating technology into their classrooms. Throughout the study, I strived to gain an understanding of what technology integration was, why it was used, and what impacted its implementation. As I collected and analyzed the stories presented by the participants, I formed an underlying foundation from the individual perspectives of 10 participants who had various levels of technology self-efficacy. The study focused on the shared experiences as well as the individual perspectives of the participants as they integrated technology in their respective classrooms.

The three guiding research questions established a reference point from which to analyze the data collected and provide emergent themes for the discussion.

The following research questions will be investigated during this study:

**RQ1:** How do teachers define technology integration in today’s secondary classroom?

**RQ2:** How do teachers make decisions about the type of technology to use in their secondary classroom with regard to their level of technology self-efficacy?

**RQ3:** How does the teacher’s individual level of technology self-efficacy impact the application of technology used within the secondary classroom?

The data will be collected from face-to-face interviews, individual classroom observations, and structured focus group sessions. The data will be analyzed according to the procedures outlined in Chapter Three. Chapter Four provides a detailed analysis of the themes as they were developed and deduced from the significant statements offered by the participants of the study. As I develop a composite description of the actual lived experiences of the
participants, the three guiding research questions will be answered. This chapter includes the following sections: (a) summary of the findings, (b) discussion of the findings and implications regarding the relevant theory and literature, (c) implications, (d) delimitations and limitations, (e) recommendations for future research, and (f) a chapter summary.

Summary of the Findings

The data analysis of the individual interviews, classroom observations, and participant focus groups revealed four main themes that were associated with technology integration: (a) perceived environment, (b) rationale for use, (c) expansion of personal knowledge, and (d) barriers faced. The themes and the related sub-themes formed a foundation of understanding that allowed the research questions to be explored and answered by the participants’ lived experiences shared during this study.

The first research question was designed to uncover the essence of what technology integration meant from a teacher’s perspective. This idea also included what the classroom looked like as it was defined through individual experience. The data analysis uncovered the first theme, perceived environment, as well as five related sub-themes: (a) increased engagement, (b) enhanced environment, (c) future preparation, (d) student motivator, and (e) student expressiveness. Throughout the data analysis, each sub-theme revealed a specific aspect of the classroom as technology was introduced and used within the curriculum. The collective views showed that the perceived environment was student-focused and that the technology used met the learning objectives and the standards being taught. Every participant said that the use of technology increased student engagement. Several participants added that the integrated technology also enhanced the learning environment because it gave more independence and creativity to the student. Several other participants recognized that the classroom provided
training and experimentation which prepared the students for the future workplace environments. The enhanced environment also led several participants to acknowledge that when technology was used, an increase in student motivation was observed. In fact, technology efforts were also recognized as a method of student expressiveness because it allowed for improved quality and better overall student work. Overall, the classroom changed from a traditional lecture and learn environment to a student-focused learning center.

The second research question focused on the reasons why technology was used. Additionally, the research question also sought insight into how a teacher learned about technology as they shared their experiences with their peers. The data analysis uncovered two specific themes directly related to the research question: (a) rationale for use and (b) expansion of personal knowledge. The theme, rationale for use, had four related sub-themes: (a) understandability, (b) school-supplied technology, (c) meet needs, and (d) recommended by others. The theme, expansion of personal knowledge, had three related sub-themes: (a) professional trainings, (b) individual research and practice, and (c) help from others.

According to the experiences shared, most participants selected a technology to use that they understood. Several participants adamantly stated that they would not use any technology piece that they did not understand. In addition, several participants stated that they used whatever technology the school had to offer. Although technology was available, several participants stated that the technology had to meet their needs before they used it. None of the participants used technology just to use it because most stated it had to have a valid purpose to be used. Additionally, a few participants said they only used technology that others had success with. In fact, these participants shared this common thread: if it worked for them, then it should work for me.
The next theme that emerged was the expansion of personal knowledge and its three related sub-themes: (a) professional trainings, (b) individual research and practice, and (c) help from others. The participants’ shared experiences were rather straightforward regarding the second research question. The majority of the participants said that they had increased their technological knowledge by attending either a school or district-based training. Although several participants voiced concerns about scheduling conflicts and depth of knowledge required before training, most stated that this was the most feasible method to gain the knowledge required. Several participants said that they possessed enough technological knowledge to work from home as they explored what the Internet had to offer. A few participants even said that they researched and practiced on the Internet before they used the technology piece in their classroom. While the more experienced participants did independent research, the least experienced relied on help from others. The low confidence participants said that they always had a reliable ally in the wings so they could get help quickly if needed. Overall, the second research question provided a unique glimpse into the individual decision making and learning process used as technology was implemented in the classroom.

The third research question focused on understanding the impact of technology integration within a secondary classroom. Specifically, this question explored the lived experiences of both successes and failures of the participants as they integrated technology in their classroom. Through the data analysis, the final theme, barriers faced, and its following four sub-themes emerged: (a) connectivity issues, (b) equipment issues, (c) availability issues, and (d) personal knowledge. The participants primarily agreed as they shared stories of breakdowns in the infrastructure. The biggest barrier to effective technology integration was connectivity issues. The participants all repeated the same phrases: the server went down, the Wi-Fi went
down, or the Internet went down. As the participants expressed, if a technology piece has been planned for the lesson and the infrastructure goes down, the lesson is most likely stopped. Several participants said that a backup plan was needed for every technology lesson.

The next barrier to integration was equipment issues since several participants said that the technology became outdated and it could not be used. Even though connectivity was the most common barrier, availability was a major issue when the state and district testing window opened. Technology that was difficult to obtain at the start of the year became non-existent during the last quarter. The participants stated it was taken by the testing administrator and used for testing purposes. Although these barriers were found to be the most common, several participants said that their personal knowledge kept them from using technology. Many participants did not want the students to know that they had limited knowledge of the technology and that they would have trouble getting it to work if they had problems. Overall the participants stated that they needed a reliable infrastructure, updated equipment, and greater personal knowledge to be effective in their technology integration efforts.

Discussion

As I read the summary of the findings, I realized that it addressed each of the guiding research questions in a very specific way. The collected lived experiences shared by the participants portrayed a unique learning environment that was infused with technology. The perceived environment became clear as I read through the participants’ stories. As I contemplated what their perceived environment looked like, I saw that a transformation had taken place. The classroom environment had moved from the traditional lecture and learn approach to a student-focused environment where the students took charge of their learning (Kim & Downey, 2016). The new learning environment offered opportunities for student exploration
and experimentation. The shift in philosophy was made possible by the integration of technology.

In other words, technology use had provided an opportunity for increased student engagement, increased individual motivation, and increased potential achievement when compared to a traditional classroom setting (Cavanaugh et al., 2011; Courts & Tucker, 2012; Huang et al., 2010; Reynolds et al., 2010; Ward et al., 2013). The main role of the teacher has moved from a content expert lecturer to a helpful guide on the side that monitors growth and achievement (King, 1993). The first research question explored the participants’ perceived environment as I sought to define what technology looked like in a secondary classroom.

With this in mind, the following definition was developed from the composite description of the participants lived experiences with technology integration. Technology integration means that an enhanced learning environment is produced through the systematic and routine use of technology. The classroom technology meets the learning objectives as well as the needs of the student. Therefore, spontaneous exploration, experimentation, and creativity can take place as the students are prepared for the 21st-century workplace. This definition is both honest and sincere, and it sets the boundaries on which the integrated environment can be developed and explored.

The following discussion of the study findings is based on the theoretical framework and the related literature that were used in this study. The underlying theoretical framework used in the study must be examined.

**Theoretical Framework**

During the study, I was guided by social cognitive theory (SCT) as put forth by Bandura (1977) and activity theory (AT) as presented by Vygotsky (1978) and later modified by Nardi
(1996) and Kaptelinin (2005). Although different in some respects, these theories are similar in outcomes because the individual learns and builds knowledge through their interactions with their specific surroundings. The results of this study are discussed within these specific frameworks using individual self-efficacy as a focal point.

**Social cognitive theory.** The findings of this study can be placed within the three distinct influential elements of SCT. As put forth by Bandura, three distinct elements influence our learning: (a) personal, (b) behavioral, and (c) environmental (Miller, 2002). Upon examination, each element can be broken down into specific parts. Personal influence consists of self-efficacy, motivation, anxiety, and experience (Bandura, 1977). Behavioral influence can be separated into cognitive strategies, metacognitive strategies, and feedback to others (Bandura, 1977). Environmental influence can be divided into modeling, achievement, and feedback from others (Bandura, 1977). Self-efficacy can be defined as possessing the innate ability to be confident in one’s set of skills and actions while being under pressure (Miller, 2002).

Personal influence was examined from three distinct perspectives of technology confidence: (a) low, (b) average, and (c) high. Those with a low confidence score were not secure in their ability to use technology in their classroom, which made technology integration more challenging. Although those with an average score were more secure in their technological ability, they still had room to improve as they integrated technology. Those with a high confidence score were very secure in their technological abilities, which meant it was easier for them to integrate technology into the classroom. This example reinforces the SCT and AT concepts whereas an individual learns from their environment, and in turn, the individual tends to practice what he or she is more confident with (Bakhurst, 2009; Bandura, 1977; Kaptelinin & Nardi, 2012).
A low confidence level tends to keep one at a low confidence level because anxiety builds when a person is not secure in his or her ability (Bandura, 1977; Miller, 2002). When faced with anxiety, one often turns to their strengths. So, if one has a low level of technology confidence, they are less likely to venture out and gain the experience needed to increase their confidence level (Bandura, 1977; Miller, 2002). Additionally, anxiety levels seem to be the opposite of one’s confidence level (Bandura, 1977; Miller, 2002).

A high confidence level tends to generate a lower anxiety level since the teacher is very confident in their ability to handle the given technology as well as any problems that may occur. Likewise, a low confidence level increases one’s anxiety level, since fear often increases when there are more unknown possibilities (Bandura, 1977; Miller, 2002).

Personal motivation is also tied to individual self-efficacy (Miller, 2002). If a teacher has a higher level of confidence, they tend to explore the use of technology more frequently than those with a lower level of confidence (Bandura, 1977; Miller, 2002). Although some teachers are motivated to learn, their confidence level keeps them at a lower level because they may need more hands-on experience to be more confident. Since it takes time as well as additional instruction to gain more confidence, lower confidence level teachers tend to stay at the lower level. A one’s self-confidence increases, it is easier to gain more experience (Bandura, 1977; Miller, 2002). The average and high confidence level teachers tend to do more training along with individual research on the Internet. These teachers often have the confidence to use a new program just by reading about it or watching an instructional video. This ability also offers additional opportunities and provides more experiences for growth and knowledge building.

It is evident that there is no replacement for personal experience. The more technology experience one gains often lead to a higher degree of confidence in his or her own ability
As in most situations, technology experience can only be gained through practice and experience. If a teacher is not confident from the start, it is difficult to move them to a higher level, since the desire to learn must be there. Although a teacher may be trapped with a lower level of confidence, the cycle can be broken by their internal motivation put forth (Bandura, 1977; Miller, 2002).

The behavioral influences, cognitive strategies, metacognitive strategies, and feedback to others were viewed through the lens of self-efficacy. Each teacher, whether low or high, brought specific skill sets to the classroom (Kim et al., 2013). Those with a higher confidence level often brought more self-knowledge to the classroom (Miller, 2002). This example included the knowledge and experience gained in their personal life using technology outside the classroom. If a teacher uses technology in his or her normal life, he or she will be more confident in its use within the classroom (Miller, 2002).

Metacognitive strategies let one plan or prepare a course of action based mainly on their personal knowledge or experience at hand (Bandura, 1977; Miller, 2002). In other words, a teacher with a lower level of confidence and little experience handles a technology problem differently when compared to a teacher who has a higher level of confidence and a greater amount of experience. In the end, one can view the situation as negative while the other views it in a more positive light. Extra outside experience often leads to higher levels of self-efficacy (Bandura, 1977; Miller, 2002).

The environmental influences, modeling, achievement, and feedback from others also were viewed through the lens of self-efficacy. It is tough to get someone to present something in which they have little knowledge. When a teacher models a lesson in front of a few colleagues, he or she obtained feedback as to how the lesson was perceived (Tilton & Hartnett, 2016). If
modifications are needed, they are incorporated into the lesson so the lesson can be given again. After several presentations and feedback sessions, the teacher should have the confidence needed so it can be present in front of the class. All in all, if the teacher did not model the lesson or receive any feedback, the teacher would still be uncomfortable in front of the students (Tilton & Hartnett, 2016). Increased self-efficacy can only be achieved through personal effort because individual confidence grows from practical experience (Bandura, 1977; Miller, 2002).

Personal achievement is another avenue where one can gain more confidence. Each teacher feels extremely confident in his or her technological abilities based on the experience gained, skills modeled, and the achievements earned (Miller, 2002; Tilton & Hartnett, 2016).

In retrospect, self-efficacy (as viewed through SCT) is something that is internalized by the individual (Bandura, 1977; Miller, 2002). One’s personal confidence can be gained or increased through many different means. With that said, the common underlying factor in SCT is one’s own motivation or internal desire to achieve (Bandura, 1977; Miller, 2002). Without the want and desire, it is difficult for one to learn at the level required to improve confidence or self-efficacy in one’s skills.

**Activity theory.** AT, as presented by Vygotsky (1978) and later modified by Nardi (1996) and Kaptelinin (2005), states that people construct knowledge through a collaborative process. The process involves the interaction between the person, known as the actor, and the activity (Bakhurst, 2009; Kaptelinin & Nardi, 2012). The interaction causes the actor to gain knowledge. As more and more interactions take place, more extensive knowledge is constructed. If the process continued, all knowledge would be based solely on the interactions between the actor and the activity. Since the interactions are taking place in the known world and their encircling environments, additional influences are introduced (Bakhurst, 2009; Kaptelinin &
Nardi, 2012). New knowledge is now constructed through the interactions of the actor and the activity as well as the influence placed upon them by the known world (Bakhurst, 2009; Kaptelinin & Nardi, 2012). The basic theory is comprised of the simple assumption that a person (the actor) learns from his or her interaction (the activity) between his or her self and the surrounding world (the object). In other words, people often build personal self-efficacy based upon their experiences within their surrounding environments.

AT reconfirms what was stated by using SCT as the underlying framework for the study. Individual self-efficacy is something that is internalized by the individual (Kaptelinin & Nardi, 2012; Miller, 2002), whereas a person’s confidence grows through the many different and unique interactions that he or she participates in. With this in mind, one’s own motivation and desire to achieve affects what is learned. In addition, the level of intensity (along with the want and desire) of a person can overcome the difficulty of learning new skills and provide the necessary knowledge required to improve confidence and self-efficacy in one’s own skills (Bakhurst, 2009; Kaptelinin & Nardi, 2012; Miller, 2002).

Related Literature

The data analysis identified four distinct themes through the collection of the lived experiences that were gathered throughout the study: (a) perceived environment, (b) rationale for use, (c) expansion of personal knowledge, and (d) barriers faced.

Perceived environment. The first theme, perceived environment, described the setting of the classroom as seen through the eyes of the teachers as they integrate technology. Since this description was a true portrayal of what the participants perceived as derived through individual discussions, it answered the first research question: How do teachers define technology integration in today’s secondary classrooms? The depiction of the perceived environment in the
study aligned with what Schurdak (1967) first reported as he integrated technology into his own classroom, that technology integration could increase student learning. Since Schurdak’s (1967) ground-breaking study, more technology has been moved into the classroom. Even though the computers used by Schurdak did not drive his lesson, their use in the classroom opened the door for other researchers to explore the possibilities.

Technology integration has traditionally been accomplished through the incorporation of technological devices and related applications that have the power to transform the traditional classroom into a student-focused environment (Bang & Luft, 2013; Buss et al., 2015; Ertmer et al., 2012). According to Downes and Bishop (2015), technology integration provided an environment that was relevant to students lives which increased student engagement. The integrated classroom put the students in charge of their learning which often led to increased student satisfaction and potentially higher levels of achievement (Courts & Tucker, 2012; Kim & Downey, 2016). As the perceived environment changed, the teacher moved from the traditional lecture and learn approach to one that allowed independent student learning and exploration (Assan & Thomas, 2012; Chien et al., 2013; King, 1993). Although many teachers are successful with the implementation of technology, integration efforts are not always maintained unless there is a fundamental change in the beliefs and understanding of the teacher (Bang & Luft, 2013; Ertmer et al., 2012; Kim et al., 2013).

As the classroom becomes more student-focused, the teacher and student begin to shape the learning process; therefore, the technology used enhances the learning environment (Bang & Luft, 2013; Kim & Downey, 2016). As the teacher stepped back and became a guide on the side, he or she provided his or her expert knowledge when asked, such as conducting a mini-lesson on a specific topic or answering an individual question face-to-face (An & Reigeluth, 2011; King,
As technology was introduced into the classroom, the classroom shifted its appearance to mirror the workplace environment (Bang & Luft, 2013; Maninger, 2006). In this scenario, the student was prepared for the future as they learned and interacted with today’s technology. Once the classroom became a modern learning lab, the students could increase their confidence level and self-efficacy as they developed an appreciation for the technology used in their daily lives (Bang & Luft, 2013).

Besides being an enhanced environment that prepared students for the future, the new classroom was also a place of motivation; it gave students access as well as the ability to gather information at the touch of a button (Fu, 2013). When technology integration was used as a learning tool, students were more engaged and often dug deeper into their own technological abilities than required (Baytak et al., 2011; Downes & Bishop, 2015). Students enjoyed using the technology, and when offered the opportunity, they progressed. Today’s student will no longer have to depend on the school’s media center or the local library for research because the information will now be available online. Students will learn by using technology in a hands-on environment, allowing applications and programs to be utilized in a variety of learning methods (Bang & Luft; 2013; Maninger, 2006). Students will also be able to articulate their understanding in a more creative manner, which has not always been the case in the traditional classroom setting (Bang & Luft, 2013; Downes & Bishop, 2015; Fu, 2013; Maninger, 2006).

At this point, a student-focused environment would allow students to take a more active role in their learning process. This newly labeled learning environment mirrored a similar learning environment used by Maninger (2006) as he found an enriched classroom fostered increased student collaboration and discussions about reading topics. By understanding this teacher-constructed example of technology integration, one can move forward and design an
enriched environment that will support student efforts to achieve instead of merely using technology to present material to them (Bang & Luft, 2013; Tamim et al., 2011).

**Rationale for use.** The second theme, rationale for use, provided insight into how a teacher thinks as they make decisions as to what technology to use in the classroom. Rationale for use also helped to answer the second research question: How do teachers make decisions about the type of technology to use in their secondary classroom with regard to their level of technology self-efficacy?

Accordingly, the most important criteria used for technology selection was understandability. First and foremost, the technology must be easy to understand and use (Ward & Parr, 2010). If the technology instruction manual required several days to read, it was most likely put on the shelf and not read. Having a higher the confidence level and a better understanding meant that the technology would be more likely to be used for a lesson (Chien et al., 2013). A teacher with a lower confidence level typically used technology less frequently. Technology has quickly become a concept that some teachers gravitate to while others shy away from it (Inan & Lowther, 2010a).

School-supplied technology was the next stated criteria since it determined whether the technology would actually be used (Inan & Lowther, 2010a; Maninger, 2006). Once a teacher decided to use a piece of technology, some groundwork had to be done (Chien et al., 2013). First, a lesson plan had to be created with a stated objective and learning goal. Next, time had to be set aside so the teacher could get an introduction to the technology. In addition, time also had to be spent on the transition from where the class was so the class would be ready for the technology used (Heath, 2017). Finally, the technology had to be reserved and scheduled for use. Optimally, the class had been prepared for selected technology and was ready for its use.
once it was brought in. If the class was not prepared, additional time has to be spent to bridge the gap. This often caused the window of use to close because the technology could not be reserved for an extended period of time.

On the other hand, the lesson may be ready for Monday. However, if the testing office needs the technology, it cannot be used by the classroom teacher at that time. This scenario left the teacher without any technology to use, which caused the teacher to scramble to cover the proposed lesson without the use of technology. Even though this scenario was relatively rare, it shook the confidence of the participants and placed the thought of it happening again in the back of their mind. If this scenario occurred more often, it could easily limit the spread of technology use throughout the school.

The final two sub-themes that emerged from the main theme, rationale for use, were meets needs and recommended by others. Once the learning goal was established, most participants felt capable of meeting student needs through the existing technology that was offered at their school (Chien et al., 2013). In addition, most participants also agreed that the lesson could be designed around the school-supplied technology. More often than not, a recommendation from a co-worker accompanied the decision to use the technology.

In most school systems, like in this study, there are always a handful of teachers who are the so-called experts in technology integration. These teachers have a high confidence level in their abilities and an innate desire to challenge their students as well as themselves. These teachers normally allowed others to use their personally-created material. Additionally, most of these teachers also had a tendency to help their co-workers in their free time (Hineman et al., 2015). Even though most participants expressed an interest in helping others, several participants said that if a specific technology piece was used too much, it often led to a decrease
in student engagement (Downes & Bishop, 2015). With this in mind, classroom teachers are strongly encouraged to use a variety of technologies so the overuse or saturation point will not be reached in their specific classroom. Any type of technology that is used too often can quickly become boring for the tech-savvy students of today. Once the students get tired of using a technology piece, they lose interest in its use and become less motivated (Downes & Bishop, 2015).

**Expansion of personal knowledge.** The third theme, expansion of personal knowledge, offered a glimpse into the growth and development plans undertaken by a teacher so that they could become more skilled and articulate in their understandings of how technology can be used. The most common method used to expand one’s technology knowledge was professional trainings (Bang & Luft, 2013). Professional trainings are normally sponsored by a school district, and they can be extremely beneficial for those that can attend. Even though professional trainings are a productive avenue for a classroom teacher, there are other methods of increasing one’s knowledge base.

A few of these additional ways, individual practice and research, often come in the form of replication. For example, a Kahoot game went extremely well for a teacher as a unit review lesson. So, since it worked well as a review, the teacher pondered whether the game could be used as an introduction to the next lesson. A little experimentation and practice could answer this question. If not, someone who regularly used the Kahoot game could be located, for a discussion on the most effective ways to use the Kahoot game. Finally, reaching out to a coworker was still an effective way to gain an understanding of how technology could be used in the classroom (Mueller et al., 2008).

**Barriers faced.** The last theme to emerge was barriers faced which lists the most
common issues faced by a classroom teacher as they attempt to use technology in the learning environment. Barriers faced also answered the final research question: How does the teacher’s individual level of technology self-efficacy impact the application of technology used within the secondary classroom? An integration barrier was an obstacle or roadblock that prohibited the use of technology by the teacher or student (An & Reigeluth, 2011). These barriers fell into two main categories, one controlled by the administration and one controlled by the teacher (An & Reigeluth, 2011; Fu, 2013; Kim et al., 2013).

The administration controlled three important factors, the connectivity of the system, the equipment viability and the availability of its use (Carver, 2016; Fu, 2013). Although connectivity can be a school specific issue, it generally fell upon to the district because the school system had to have a viable and working network (Carver, 2016; Chien et al., 2013). Connectivity issues were often at the heart of many teacher problems (Carver, 2016; Oncu et al., 2008; Tilton & Hartnett, 2016). Once a teacher discontinued the use of a specific technology due to problems outside their control, it became more difficult to get them to return (Skaza et al., 2013). If the perceived reward was not obtainable to the teacher, they moved on to something else. If the end of a lesson was designed to generate a printed document and the printer failed to work, the lesson failed, since student work was unavailable for grading. In addition, if the network equipment failed due to age or overuse, the lesson stopped until the equipment issue was corrected. The network infrastructure must be maintained in good working order at all times, or the equipment should be replaced immediately since network errors are one of the most common type of obstacle (Carver, 2016). Furthermore, a backup plan was strongly suggested for any technology-based lesson because even the best-designed technology was not always guaranteed to work.
The next sub-theme, availability issues, caused issues for technology use in the classroom. Availability issues in this study ranged in scope from the iPads being all signed out to a teacher who needed 28 iPads for the class with only 24 available on the cart. If a piece of technology were constantly unavailable, it would not be used by the teacher even if it became available (Carver, 2016). Likewise, if a hard to use technology piece was available, it generally was used by a knowledgeable teacher (Hineman et al., 2015). If a teacher had a low confidence level, they usually sought out a co-worker for help and a recommendation of what technology piece to use. Having a higher confidence level generally opened the possibilities of experimentation on behalf of a more knowledgeable teacher (Hineman et al., 2015). Even if the technology was scheduled for use in the classroom by a participant, there was a distinct possibility of it being unavailable due to testing requirements. The participants in this study shared numerous occasions when the availability of technology was affected by the testing schedule. Even though most state-mandated testing occurred during the last 12 weeks of the school year, some districts were testing every quarter. With that in mind, if a testing administrator needed technology for testing, the testing administrator took it and used it for testing purposes. This conflict of use caused many teachers to avoid using technology altogether. If the teacher planned for its use and the technology was taken away for testing, the teacher ended up using a traditional classroom lesson (Skaza et al., 2013). These factors are important for the educational community to understand because they are solvable. If a district-wide technology management plan was developed by the stakeholders involved, the district and school-supplied technology could be used in an effective and productive manner.

On the other hand, some barriers are controlled by the teacher. The most important barrier controlled by the teacher is their own personal knowledge (An & Reigeluth, 2011). In
regard to one’s personal knowledge, this is squarely the teacher’s own responsibility (Carver, 2016). Although some technological knowledge may be required for hiring, incoming teachers are not tested for their ability to use technology in a classroom. A teacher may be able to stay under the radar for a long time and effectively not use any technology in the classroom. This situation not only affects the students, but it also affects the teacher because their classroom is set up and used as a teacher-centered classroom. The traditional set up will not provide the challenges found across the learning environment in other student-centered classrooms (Baytak et al., 2011; Kim & Downey, 2016). Once the students realize that they will not be challenged in a meaningful way, they tend to disengage and lose interest in their learning (Downes & Bishop, 2015). This situation often makes handling the classroom more difficult for even the most experienced teacher. Having vast content knowledge, good instructional skills, or strong abilities, like mentoring and relationship building, are not enough (Kim et al., 2013).

Implications

By design, this type of qualitative study does not lend itself to a generalization that can be applied to other school districts, even if the districts are close in both size and demographics. The small, purposively-selected sample used to gain an understanding of the phenomenon under study limits the study’s generalizability. However, it highlights the lived experiences of that same group as they integrated technology in their classroom. Based on the discussions and information gathered, two main educational groups can benefit from this study’s findings: (a) district leadership and (b) classroom teachers.

District Leadership

Because the district leadership is responsible for running the entire school district, it is vital that the infrastructure is maintained logically with a student-focused mindset (Carver, 2016;
Chien et al., 2013). Amid the everyday activity, teachers and students are often relegated at a local school site, which can cause the district to lose sight of the importance of the teacher and student focal point within the classroom. The district could easily end up making decisions without the appropriate input of all stakeholders involved. When this situation happens, an important group of stakeholders (the classroom teachers) become lost in the daily shuffle and are potentially left out of the educational equation.

In the attempt to bring the teachers back in, the district can inadvertently group all teachers together and make decisions based on one facet of the group, such as only getting input from core subject teachers or those who are extremely confident with technology. Even though teachers are similar in nature, they are just as diverse as their students, so decisions should be made with everyone in mind, not just one specific group or characteristic. For example, this study had the same number of low confidence level teachers as it had in the high confidence level group. Although the average confidence level group had the largest number, its viewpoint did not always reflect the majority of the participants. The results of the study identified several areas of potential improvement for the district and school-based leadership. These specific areas were connectivity issues, equipment issues, and availability issues.

**Connectivity issues.** The connectivity issues were barriers faced by the classroom teachers. Whether it was the school Wi-Fi going down or a server offline at the district, it caused a problem in the classroom and held up the learning process. Nevertheless, the school district is responsible for the entire network infrastructure (Carver, 2016; Chien et al., 2013; Tilton & Hartnett, 2016). The district also has a duty to maintain and operate the network in an efficient manner while keeping connectivity issues to a minimum (Carver, 2016; Tilton & Hartnett, 2016). In addition, the infrastructure must be secure and able to handle the volume of users during both
the high and low peak times. While no network is 100% reliable, the district must ensure that their network exists in its best working order.

**Equipment issues.** The equipment issues were barriers that were faced by the classroom teacher. Since a district does not have an unlimited budget, they must be very frugal when it comes to purchasing technology for the entire district (Hechter & Vermette, 2013). While Beach County’s goal is to achieve a one-to-one computer to student ratio, it must still plan for the purchases as well as replacements of outdated equipment. The study found that several participants had older equipment that needed repair. This equipment failed on a regular basis until it was finally broken. Whether the equipment issues were district or school-based, the ultimate responsibility fell on the district because they were tasked with the overall maintenance and upkeep of all school-related property (Carver, 2016; Chien et al., 2013).

**Availability issues.** The availability issues were also barriers faced by the classroom teacher. Although the lack of availability was a common complaint of the study’s participants, the barrier had two facets. First, the lack of availability was an inventory and purchasing problem where there was not enough capacity to meet the overall demand. Whether it was lack of funds available or prohibited costs, the district was not in position to purchase a technological device for every student in the school district. This meant that the district had to manage limited resources across the entire learning environment effectively. Even though availability was difficult to manage at the district level for every school, the district still shouldered the responsibility (Carver, 2016; Chien et al., 2013).

On the other hand, lack of availability also became a required mandate as the existing technology also had to cover the testing requirements of state and district assessments. Once the testing window opened, there was an urgent need to pull all technology from classroom use and
use it for testing. Whether intended or not, the participants got the message; technology was more important to student testing than it was to teaching and learning in the classroom. While both occurrences made it hard for the classroom teacher to schedule technology for classroom use, it was totally frustrating to have it taken away for an entire quarter. Nevertheless, the district still shoulders the responsibility on both fronts since the district needs to ensure that each school has the technology necessary to function (Carver, 2016). This identified barrier can keep teachers from using the available resources since they will not plan for its use if they believe the technology will not be available (Cullen & Greene, 2011).

These obstacles show that there must be a district understanding as for why these barriers are being faced by classroom teachers. Since the district knows the demographics of each school as well as the technology located there, they are responsible for the effective and productive use of their technology. At this point, a master, district-wide technology management plan must be put into place to maximize and balance the use of the existing technology. This may also include the transfer of some of the district’s authority to the school-based leadership. Although these steps may help to maintain consistency in the district’s master technology management plan, preparations must still be made for any unexpected obstacles.

**Classroom Teachers**

Classroom teachers were the focus of this study, and they provided several key findings that can be directly used to help a teacher. First, the participants agreed that technology integration improved the learning environment since its effective implementation enhanced the classroom and improved the quality of student work. Next, the majority of the participants said that technology integration efforts increased student motivation which in turn increased student engagement. The increase in motivation and student engagement also brought about a decrease
in classroom discipline issues. Likewise, student articulation improved with the use of technology in the classroom. The students completed more creative assignments. Even though these improvements can be attributed to technology integration, integration efforts are not taking off across the entire learning community. While most participants in the study agreed that technology was a good learning tool for the classroom, overall integration efforts still lag behind where these efforts should be.

Once the level of technological awareness is extended throughout the learning environment, the responsibility to understand and use the technology can be established. Since technology will not install itself or be used by someone who does not understand it, it is important to raise the overall awareness of its use. This means that there must be a buy-in to the integration of technology effort on a schoolwide basis. The district leadership, the school leadership, and the teachers must come to a consensus as to the use of the available technology to enhance student learning (Carver, 2016; Chien et al., 2013; Martin & Carr, 2015). This paradigm shift will have a cost.

Even though the paradigm shift will be beneficial to everyone, the teachers must put forth the time and effort required to extend their understanding and use the technology in their classroom (Carver, 2016; Heath, 2017; Martin & Carr, 2015). Additionally, the teachers must also be compelled to spend the extra time needed to develop and establish a technology-enhanced classroom (Bang & Luft, 2013; Heath, 2017). Although time-consuming, planning for technology use in the classroom can help teachers become more efficient and productive with their resources (Heath, 2017; Martin & Carr, 2015). If a true commitment is made and the effort is put forth, the students will reap the benefits.
Delimitations and Limitations

This study used a purposively-selected sample from a medium to large-sized district located in the Southeastern United States. Before selection, the potential sample was segmented into three technology self-efficacy groups: (a) low, (b) average, and (c) high based on their individual scores after completing the TICS questionnaire. Since the available technology may differ from school to school and district to district, some potential participants may have a higher level of self-efficacy due to the equipment or methods used at their schools. The unequal distribution of technological equipment may cause the individual’s TICS scores to be either deflated or inflated which in turn may cause an individual to be placed in a higher or lower group based upon that individual’s actual technology self-efficacy level. In addition, the answers to the TICS questionnaire are self-reported, which may also cause an individual to be placed in a higher or lower group based upon an under or over estimation of one’s actual ability or self-efficacy with regard to technology integration.

The findings of this study are limited in their generalizability to other school districts since a small, purposively-selected sample was used to gain an understanding of the phenomenon under study. Per Schwandt (2007), a generalization is a process of inferring characteristics from an observed population to an unobserved population. Although other school districts may have similar populations, this study’s population may not have the same demographics or the same technology-related characteristics to make a viable generalization as to the findings of this study. In addition, the study was affected by several additional school-related factors experienced during the study’s timeline.

Besides the small sample size, the respondent population was affected by low response rate. The low response rate may be attributed to two distinct factors. First, the study began in
early April of 2015 after the IRB was approved. Unfortunately, this was the fourth study conducted during the school year in Beach County. Since there were several studies conducted earlier in the year, the overall interest and corresponding response rate for this study may have been lower than normal. In addition, the starting window of the study coincided with the end of the year student testing window as well as the beginning of the teacher evaluation period. At this point in the year, the teachers were mainly focused on student testing and personal evaluations. Since student testing and personal evaluations are very important to individual teachers, these factors likely contributed to the low response rate experienced at the beginning of the study.

Furthermore, the study was set up in phases, such as the TICS questionnaire, individual interviews, classroom observations, and focus group interviews. Since the study started in April 2015, some teachers may have thought the study was too involved, and they may have perceived that all four phases needed to be completed by the end of the school year. With the given start time, the researcher was only able to complete the TICS questionnaire, the pilot study, and the initial in-depth interviews. The classroom observations and the focus group interviews were completed the following semester. I believe that there would have been a higher response rate if the study had begun at the beginning of the school year. In addition, there may also have been more interest if this study had been conducted earlier in the school year.

**Recommendations for Future Research**

Due to the limitations experienced in this study, I recommend the study to be replicated in a larger school district. The replication of study should allow for an earlier start date, such as the beginning of a new school year. This change could provide more interest in the study as well as ensure that it is completed before the teacher evaluation and student testing periods begin. Since the TICS questionnaire response rate was low, I recommend using a larger number of
potential teachers. A larger potential pool of teachers may help increase the response rates for the TICS questionnaire as well as provide for a larger participant pool when selecting potential study participants.

I also recommend future research to be conducted with regard to the relationships that exist between teachers of various levels of technology self-confidence and how they interact at their respective schools. In addition, future research needs to be conducted with regard to how professional development affects a teacher’s beliefs and confidence level in their individual ability to understand, manage, and use technology in the classroom. Finally, future research needs to be conducted on the idea that a saturation point may exist for technology use in the classroom. Several teachers mentioned that they only use a technology for a certain period of time then move on to something else once it is shared with the entire staff. These teachers also said that once a large portion of the school’s staff starts to use the same program, it is no longer unique and the students get tired of using it. This example can lead to technology integration efforts that are unsuccessful. This can be discouraging to a teacher who is trying to use a widely-used technology piece in the classroom for the first time.

Summary

The ensuing discussion centered around the lived experiences of the study participants as they described their ideas and reflections about technology, detailed how their decisions were made, and explained how they expanded their understanding and shared knowledge. From the discussions, the following definition was developed. Technology integration is an enhanced learning environment, produced through the regular and habitual use of technology. The classroom technology sustains the learning objectives as well as the needs of the student. Therefore, exploration and experimentation can take place as the students are prepared for the
21st-century workplace.

With this definition in mind, the discussion turned to the related literature and the connections to the identified themes as well as the implications for the educational community, specifically the district leadership and the classroom teacher. The implications for the district leadership were: (a) connectivity issues, (b) equipment issues, and (c) availability issues. This example means that the district leadership must supply modern equipment as well as the necessary infrastructure to use it. In addition, the district leadership must develop and maintain a master technology use plan so equipment can be purchased and updated as required.

The implication for the classroom teacher was to put forth the effort to increase their technology self-efficacy along with their ability to use technology in the classroom. The required paradigm shift meant that a teacher had to make an authentic pledge to become more knowledgeable as to the use of technology in the classroom. In addition, a teacher needs to pledge to spend more time planning for its use in the classroom. Through their expanded knowledge and understanding of technology, teachers will become even more essential to the overall learning process.

The delimitations of this study consisted of the fact that the individual scores used in the TICS questionnaire were self-reported based on one’s individual knowledge of technology used in the classroom. Since the technology available can vary from district to district as well as from school to school, the actual scores may be deflated or inflated based upon that participant’s situation. The limitations of this study involved the small, purposively selected sample used. Due to the sample used, the study is limited in its generalizability to other school districts since other school districts may not have the same individual demographics or the same technology-related characteristics. In addition, the study had a lower than expected response rate due to the
timeline of the study and the study phases.

Future research is recommended in the following areas: (a) the relationships that exist between teachers of various levels of technology self-confidence and how they interact at their respective schools; (b) how professional development and district offerings affect a teacher’s beliefs and confidence level in their individual ability to understand, manage, and use technology within the classroom; (c) the idea that a saturation point may exist for technology use in the classroom. In addition, I recommend the study to be replicated so that a larger potential participant pool can be used for the study.
REFERENCES


doi:10.1080/07380560802688240


Downes, J., & Bishop, P. (2015). The intersection between 1:1 laptop implementation and the characteristics of effective middle level schools. *Research in Middle Level Education Online, 38*(7), 1-16.


Retrieved from http://www.editlib.org/p/24421


APPENDIX A

Approval Page for the School District Research Application

Part III

Attach to this application:

- Research proposal that includes the purpose, statistical and design methodology, and benefit to the district.
- All research instruments
- IRB approval, if applicable
- A one-page letter or summary that can be shared with principals describing the tasks that will be required of teachers, students, or schools.

One (1) copy of the final report, thesis, dissertation, or study results with an executive summary must be submitted to the Director of Research no later than one month after submission of the document to the sponsoring institution/agency.

Further, I understand and will abide by the laws related to protection of human subject rights and privacy. I will maintain confidentiality of all records, and I will destroy and eliminate any reference to school, district, or individual identity.

[Signatures]

Date 1/16/2015

For Office Use Only

Granted: ___  Denied: ___  Date: ___/___/___

Conditions, if any

Note to Researcher: When seeking approval at the school level, a copy of your approval letter MUST be shown to the school principal.
APPENDIX B

Liberty University Institutional Review Board Approval Letter

LIBERTY UNIVERSITY
INSTITUTIONAL REVIEW BOARD

April 1, 2015

Christopher L. Brantley
IRB Approval 2082.040115: Secondary Teachers' Perceptions and Self-Efficacy Regarding Technology Integration: A Phenomenological Study

Dear Christopher,

We are pleased to inform you that your above study has been approved by the Liberty IRB. This approval is extended to you for one year from the date provided above with your protocol number. If data collection proceeds past one year, or if you make changes in the methodology as it pertains to human subjects, you must submit an appropriate update form to the IRB. The forms for these cases were attached to your approval email.

Thank you for your cooperation with the IRB, and we wish you well with your research project.

Sincerely,

[Signature]

Liberty University | Training Champions for Christ since 1971

1971 University Blvd. Lynchburg, VA 24515 IRB@Liberty.EDU FAX (434) 522-0506 WWW.LIBERTY.EDU
APPENDIX C

School Permission Recruitment Script

The following recruitment script will be used for each participating school.

Good afternoon. My name is Chris Brantley and I am a graduate student at Liberty University. I am currently conducting a research study to examine how teachers from various levels of technology self-efficacy perceive and implement technology within their secondary classroom. The study involves the use of an online questionnaire that will return an overall technology confidence score for each participating staff member. The confidence score will be used to group and select 10-15 participants for the next phase of the study, which consists of one face-to-face interview, one classroom observation and one focus group session. The interview and focus group sessions will be audio recorded for transcription purposes. Although there is no compensation for participating in the study, each participating school will receive the descriptive statistics for their respective school staff population that completes the online questionnaire. All information gathered will be confidential and viewed only by the researcher. A pseudonym will be used for the name of the school as well as each participating staff member. In any sort of report I might publish, I will not include any information that will make it possible to identify a participant. Your choice to allow your staff to participate or not participate will not affect your school or staff in any way. If you would like to allow your school staff to participate, you will need to sign the school permission form. Do you have any questions? Thank you for your time and consideration.
APPENDIX D

SCHOOL PERMISSION FORM

The following school permission form will be used for each participating school.

SCHOOL PERMISSION FORM
Secondary Teachers’ Perceptions and Self-Efficacy Regarding Technology Integration: A Phenomenological Study.
Christopher L. Brantley
Liberty University
Ed.D. Candidate, School of Education

Your school’s staff is being invited to participate in a research study of secondary teachers’ perceptions of classroom technology integration in regard to their individual technology self-efficacy level. Your school was selected as a possible study location because your school is located on the west side of school district. In addition, your school district has made strong commitments to integrate technology within the classroom. I ask that you read this form and ask any questions that you may have before agreeing to allow your school’s instructional staff to participate in the study.

This study is being conducted by Christopher L. Brantley, a K-12 educator, and an Ed.D. candidate at Liberty University.

Background Information:
The purpose of this phenomenological study is to understand how the perceptions of secondary teachers impact their classroom technology integration decisions.

Procedures:
After granting permission to use your school as a study location, you will allow the administration of the Technology Integration Confidence Scale (TICS) questionnaire to your school’s instructional staff. The TICS questionnaire will only be used to gather descriptive statistics and to identify potential participants for the study.

Risks and Benefits of being in the Study:
I do not anticipate any risks in regard to your school’s participation in this study other than those encountered in day-to-day life. The benefits of the study are that you will gain a better understanding of how confident your instructional staff is in regard to integrating technology within the classroom.

Compensation:
You will not be compensated for your school’s participation in the study, but you will be provided with the descriptive statistics concerning the confidence level of your school’s instructional staff in regard to technology integration within the classroom.

Confidentiality:
The records of this study will be kept private. In any sort of report I might publish, I will not include any information that will make it possible to identify a subject. Research records will be stored securely and only the researcher will have access to the records. Your staff’s information as well as their responses gathered from the questionnaire will be kept confidential. The questionnaire data will be stored on a secured web site. Any additional information will be kept in a secured file cabinet under lock and key, whereas the researcher will have the only key to open the cabinet. The reporting of the results of the study will be presented in such a way as to not disclose your school or staff’s identity.

**Voluntary Nature of the Study:**

Participation in this study is voluntary. Your decision whether or not to allow your staff to participate will not affect your current or future relations with Liberty University, or the school district. If you decide to allow your staff to participate, they are free to not answer any question or withdraw at any time without affecting those relationships.

**Contacts and Questions:**

The researcher conducting this study is Christopher L. Brantley. You may ask any questions you have now. If you have questions later, **you are encouraged** to contact him at (727) 774-6700 or email address: cbrantle@pasco.k12.fl.us. You may also contact the dissertation chair, Dr. L. Daniele Bradshaw, by e-mail at: ldbradshaw3@liberty.edu.

If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher, **you are encouraged** to contact the Institutional Review Board, 1971 University Blvd, Suite 1837, Lynchburg, VA 24502 or email at irb@liberty.edu

*You will be given a copy of this information to keep for your records.*

☐ I agree to allow my school as well as my school’s instructional staff to participate in the study.

Principal signature: _____________________________ Date: ________________

Signature of Investigator: _____________________________ Date: ________________
APPENDIX E

Invitation to Participate in the Online Questionnaire – Initial Email

Dear Secondary Teacher,

As a graduate student in the Education Department at Liberty University, I am conducting research as part of the requirement for a Doctorate Degree. The purpose of my research is to examine how teachers from various levels of technology self-efficacy perceive and implement technology within their secondary classroom.

If you agree to take part in this study, you will be asked to complete the online Technology Integration Confidence Scale (TICS) questionnaire located on the Survey Monkey website at: https://www.surveymonkey.com/s/K9TLGDV. The online TICS questionnaire should take approximately 20 minutes to complete.

The online TICS questionnaire will be used to collect data and demographic information so a potential participant pool can be created. The potential participant pool will be used to select 10 - 15 secondary teachers. The selected secondary teachers will be invited to participate in the next phase of the study, which will include: (a) one individual interview, (b) one classroom observation, and (c) one focus group session. The statement of consent to participate in this study is included in the TICS questionnaire.

If you have questions, you are encouraged to contact the researcher, Christopher L. Brantley. You may contact him at (727) 774-6700 or email address: cbrantle@pasco.k12.fl.us. You may also contact the dissertation chair, Dr. L. Daniele Bradshaw, by e-mail at: ldbradshaw3@liberty.edu.

Thank you for your time and consideration. Your input is very important and will be greatly appreciated.

Sincerely,

Christopher L. Brantley
APPENDIX F

Invitation to Participate in the Online Questionnaire – Follow-up Email

Dear Secondary Teacher,

As a graduate student in the Education Department at Liberty University, I am conducting research as part of the requirement for a Doctorate Degree. Two weeks ago an email was sent to you inviting you to participate in a research study. This follow-up email is being sent to remind you to complete the online Technology Integration Confidence Scale (TICS) questionnaire if you would like to participate and have not already done so. The deadline for participation is [date]. The TICS questionnaire should take approximately 20 minutes to complete and is located on the Survey Monkey website at: https://www.surveymonkey.com/s/K9TLGDV.

The online TICS questionnaire will be used to collect data and demographic information so a potential participant pool can be created. The potential participant pool will be used to select 10 - 15 secondary teachers. The selected secondary teachers will be invited to participate in the next phase of the study, which will include: (a) one individual interview, (b) one classroom observation, and (c) one focus group session. The statement of consent to participate in this study is included in the TICS questionnaire.

If you have questions, you are encouraged to contact the researcher, Christopher L. Brantley. You may contact him at (727) 774-6700 or email address: cbrantle@pasco.k12.fl.us. You may also contact the dissertation chair, Dr. L. Daniele Bradshaw, by e-mail at: ldbradshaw3@liberty.edu.

Thank you for your time and consideration. Your input is very important and will be greatly appreciated.

Sincerely,

Christopher L. Brantley
APPENDIX G

Participant Consent Form

The Technology Integration Confidence Scale Questionnaire

Dear Participant,

You are being invited to participate in a research study of secondary teachers’ perceptions of classroom technology integration in regard to their individual technology self-efficacy level. You were selected as a possible participant for this study because you are a secondary teacher with a work site located on the west side of the school district.

This study is being conducted by Christopher L. Brantley, a K-12 educator, and an Ed.D. candidate at Liberty University, under the direction of Dr. L. Daniele Bradshaw, Assistant Professor, School of Education.

Background Information: The purpose of this phenomenological study is to understand how the perceptions of secondary teachers impact their classroom technology integration decisions.

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

First, you would be asked to complete the Technology Integration Confidence Scale (TICS) questionnaire. After the completion of the questionnaire, you may be contacted and asked to participate in the next phase of the study. Next, if selected, you would be asked to participate in a face-to-face interview in regard to your perceptions as well as your efforts involving technology integration in the classroom. The interview will take approximately 15 to 30 minutes to complete, and will be audio recorded for transcription purposes. Following the interview, you would be observed in your classroom on one occasion in order to gain a better understanding of your integration efforts within the classroom. The observation will take approximately 30 to 45 minutes to complete. After completing the classroom observation, you would be asked to participate in a small focus group in regard to your technology integration experiences. The focus group will take approximately 30 to 45 minutes to complete, and would be audio recorded for transcription purposes. At the conclusion of the study, you may be asked to review your individual transcript or the study narrative to help ensure the consistency of the information collected.

Risks and Benefits of being in the Study: I do not anticipate any risks in regard to your participation in this study other than those encountered in day-to-day life. If selected for the second phase of the study, the potential benefits are that you will help the educational community gain a better understanding of how teacher perceptions affect the manner of how technology can be integrated within the classroom.

Compensation: You will not be compensated for your participation in the study.

Confidentiality: The records of this study will be kept private. In any sort of report I might publish, I will not include any information that will make it possible to identify a subject. Research records will be stored securely and only the researcher will have access to the records. Your information as well as your responses gathered from the questionnaire will be kept confidential. The questionnaire data will be stored on a secured web site. Any additional information will be kept in a secured file cabinet under lock and key, whereas the researcher will have the only key to open the cabinet. The reporting of the results of the study will be presented in such a way as to not disclose your identity.

Voluntary Nature of the Study:

Participation in this study is voluntary. Your decision whether or not to participate will not affect your current or future relations with Liberty University, the school district, or your school. If you decide to
participate, you are free to not answer any question or withdraw at any time without affecting those relationships.

**How to withdraw from the study:**

If you wish to withdraw, please inform the researcher by email at cbrantley@pasco.k12.fl.us. Participants who wish to withdraw from the study will not have their questionnaire, interview, classroom observation, or focus group discussion contributions included in the study. Once the participant withdraws from the study, all data and any audio recordings of that participant will be destroyed and erased.

**Contacts and Questions:** The researcher conducting this study is Christopher L. Brantley. You may ask any questions you have now. If you have questions later, you are encouraged to contact him at (727) 774-6700 or email address: cbrantley@pasco.k12.fl.us. You may also contact the dissertation chair, Dr. L. Daniele Bradshaw, by e-mail at ldbradshaw3@liberty.edu.

If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher, you are encouraged to contact the Institutional Review Board, 1971 University Blvd, Suite 1837, Lynchburg, VA 24515 or email at irb@liberty.edu.

**Statement of Consent:**

I have read and understood the above information. I have asked questions and have received answers. I consent to participate in the study.

1. I agree to participate in the study, AND if selected for the second phase, I consent to having the interview and focus group sessions audio-recorded.
   
   Yes ☐
   No ☐

2. Please enter your name. (example: Michael Smith)

3. Please enter today's date.

   ______ / ______ / ______

4. Please enter your work site location. (example: Bayport Middle)

   ____________________________

Thank you for participating in this survey. Your feedback is very important.
Dear Secondary Teacher,

As a graduate student in the Education Department at Liberty University, I am conducting research as part of the requirement for a Doctorate Degree. The purpose of my research is to examine how teachers from various levels of technology self-efficacy perceive and implement technology within their secondary classroom.

You were selected as a possible participant for this study because you completed the Technology Integration Confidence Scale (TICS) questionnaire, have had some level of experience with integrating technology within the classroom, and have been teaching for at least one full year. If you agree to take part in this study, you will be asked to complete one interview, one classroom observation, and one focus group session. At the conclusion of the study, you may be asked to review your individual transcript or the study narrative to help ensure the consistency of the information collected.

The face-to-face interview will take approximately 15 to 30 minutes to complete, and will be audio recorded for transcription purposes with your permission. The observation will take approximately 30 to 45 minutes to complete. The focus group session will take approximately 30 to 45 minutes to complete, and will be audio recorded for transcription purposes with your permission.

To participate in this study, please contact me to schedule an interview at (352) 476-6576.

If you have questions, you are encouraged to contact the researcher, Christopher L. Brantley. You may contact him at (727) 774-6700 or email address: cbrantle@pasco.k12.fl.us. You may also contact the dissertation chair, Dr. L. Daniele Bradshaw, by e-mail at: ldbradshaw3@liberty.edu.

Thank you for your time and consideration. Your participation is very important and will be greatly appreciated.

Sincerely,

Christopher L. Brantley
APPENDIX I

Invitation to Participate in the Research Study – Follow-up Letter

Dear Secondary Teacher,

As a graduate student in the Education Department at Liberty University, I am conducting research as part of the requirement for a Doctorate Degree. Last week, a letter was sent to you inviting you to participate in a research study. This follow-up letter is being sent to remind you to respond if you would like to participate and have not already done so. The deadline for participation is [date].

If you choose to participate in this study, you will be asked to complete one interview, one classroom observation, and one focus group session. At the conclusion of the study, you may be asked to review your individual transcript or the study narrative to help ensure the consistency of the information collected.

The face-to-face interview will take approximately 15 to 30 minutes to complete, and will be audio recorded for transcription purposes with your permission. The observation will take approximately 30 to 45 minutes to complete. The focus group session will take approximately 30 to 45 minutes to complete, and will be audio recorded for transcription purposes with your permission.

To participate in this study, please contact me to schedule an interview at (352) 476-6576.

If you have questions, you are encouraged to contact the researcher, Christopher L. Brantley. You may contact him at (727) 774-6700 or email address: cbrantle@pasco.k12.fl.us. You may also contact the dissertation chair, Dr. L. Daniele Bradshaw, by e-mail at: ldbradshaw3@liberty.edu.

Thank you for your time and consideration. Your input is very important and we be greatly appreciated.

Sincerely,

Christopher L. Brantley
The Technology Integration Confidence Scale Questionnaire

Dear Participant,

You are being invited to participate in a research study of secondary teachers' perceptions of classroom technology integration in regard to their individual technology self-efficacy level. You were selected as a possible participant for this study because you are a secondary teacher with a work site located on the west side of the school district.

This study is being conducted by Christopher L. Brantley, a K-12 educator, and an Ed.D. candidate at Liberty University, under the direction of Dr. L. Daniele Bradshaw, Assistant Professor, School of Education.

Background Information: The purpose of this phenomenological study is to understand how the perceptions of secondary teachers impact their classroom technology integration decisions.

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

First, you would be asked to complete the Technology Integration Confidence Scale (TICS) questionnaire. After the completion of the questionnaire, you may be contacted and asked to participate in the next phase of the study. Next, if selected, you would be asked to participate in a face-to-face interview in regard to your perceptions as well as your efforts involving technology integration in the classroom. The interview will take approximately 15 to 30 minutes to complete, and will be audio recorded for transcription purposes. Following the interview, you would be observed in your classroom on one occasion in order to gain a better understanding of your integration efforts within the classroom. The observation will take approximately 30 to 45 minutes to complete. After completing the classroom observation, you would be asked to participate in a small focus group in regard to your technology integration experiences. The focus group will take approximately 30 to 45 minutes to complete, and would be audio recorded for transcription purposes. At the conclusion of the study, you may be asked to review your individual transcript or the study narrative to help ensure the consistency of the information collected.

Risks and Benefits of being in the Study: I do not anticipate any risks in regard to your participation in this study other than those encountered in day-to-day life. If selected for the second phase of the study, the potential benefits are that you will help the educational community gain a better understanding of how teacher perceptions affect the manner in which technology can be integrated within the classroom.

Compensation: You will not be compensated for your participation in the study.

Confidentiality: The records of this study will be kept private. In any sort of report I might publish, I will not include any information that will make it possible to identify a subject. Research records will be stored securely and only the researcher will have access to the records. Your information as well as your responses gathered from the questionnaire will be kept confidential. The questionnaire data will be stored on a secured web site. Any additional information will be kept in a secured file cabinet under lock and key, whereas the researcher will have the only key to open the cabinet. The reporting of the results of the study will be presented in such a way as to not disclose your identity.

Voluntary Nature of the Study:

Participation in this study is voluntary. Your decision whether or not to participate will not affect your current or future relations with Liberty University, the school district, or your school. If you decide to
participate, you are free to not answer any question or withdraw at any time without affecting those relationships.

How to withdraw from the study:

If you wish to withdraw, please inform the researcher by email at cbrantle@pasco.k12.fl.us. Participants who wish to withdraw from the study will not have their questionnaire, interview, classroom observation, or focus group discussion contributions included in the study. Once the participant withdraws from the study, all data and any audio recordings of that participant will be destroyed and erased.

Contacts and Questions: The researcher conducting this study is Christopher L. Brantley. You may ask any questions you have now. If you have questions later, you are encouraged to contact him at (727) 774-6700 or email address: cbrantle@pasco.k12.fl.us. You may also contact the dissertation chair, Dr. L. Daniele Bradshaw, by e-mail at lbradshaw3@liberty.edu.

If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher, you are encouraged to contact the Institutional Review Board, 1971 University Blvd, Suite 1837, Lynchburg, VA 24515 or email at irb@liberty.edu.

Statement of Consent:

I have read and understood the above information. I have asked questions and have received answers. I consent to participate in the study.

1. I agree to participate in the study, AND if selected for the second phase, I consent to having the interview and focus group sessions audio-recorded.
   Yes O No O

2. Please enter your name. (example: Michael Smith)

3. Please enter today's date.

   __/__/____

4. Please enter your work site location. (example: Bayport Middle)

Thank you for participating in this survey. Your feedback is very important.
The Technology Integration Confidence Scale Questionnaire

Instructions: For this survey, you will be asked to rate how confident you are that you can complete certain technology integration tasks on the following scale:

0 - Not confident at all  
1 - Slightly confident  
2 - Somewhat confident  
3 - Fairly confident  
4 - Quite confident  
5 - Completely confident

Although these items are worded as if you were already teaching, rate your confidence as it is at this moment. The items are presented in one of two formats. The first format presents an image and an associated task. For example:

Example Item #1:

In the document pictured below, how confident are you that you can find the misspelled words?

![Document with misspelled words]

___ Not confident at all  
___ Slightly confident  
___ Somewhat confident  
___ Fairly confident  
___ Quite confident  
___ Completely confident

Example Item #2:

The club you sponsor will be giving a presentation to detail their activities at the next assembly. The assembly hall is equipped with a computer and an LCD projector. How confident are you that you can help the students create an effective presentation using PowerPoint, or another slide show program?

___ Not confident at all  
___ Slightly confident  
___ Somewhat confident  
___ Fairly confident  
___ Quite confident  
___ Completely confident
Technology Integration Confidence Scale Questionnaire

Items 5 through 10 refer to this image (Window A). Rate how confident you are at this moment and without any further instruction or practice to accomplish the tasks listed.

*Window A:*

5. Identify the sound file in Window A
   - Not confident at all
   - Slightly confident
   - Somewhat confident
   - Fairly confident
   - Quite confident
   - Completely confident

6. Identify the graphic/image files in Window A
   - Not confident at all
   - Slightly confident
   - Somewhat confident
   - Fairly confident
   - Quite confident
   - Completely confident

7. Identify the word processing document in Window A
   - Not confident at all
   - Slightly confident
   - Somewhat confident
   - Fairly confident
   - Quite confident
   - Completely confident

8. Open, edit, and save the file named "grades.xls" in Window A
   - Not confident at all
   - Slightly confident
   - Somewhat confident
   - Fairly confident
   - Quite confident
   - Completely confident

9. Delete the file named "refs.doc" in Window A
   - Not confident at all
   - Slightly confident
   - Somewhat confident
   - Fairly confident
   - Quite confident
   - Completely confident

10. Rename the document "index.html" in Window A
    - Not confident at all
    - Slightly confident
    - Somewhat confident
    - Fairly confident
    - Quite confident
    - Completely confident
The Technology Integration Confidence Scale Questionnaire

Read the following situations and rate how confident you are at this moment and without any further instruction or practice to accomplish the tasks they propose.

1. Your district is rolling out a new technology at each school. They invite representatives from each department to an in-service demonstration. How confident are you that you can effectively learn this new technology during the in-service?
   - Not confident at all
   - Slightly confident
   - Somewhat confident
   - Fairly confident
   - Quite confident
   - Completely confident

2. The news has recently featured a new online program that you think may be helpful in your classes. How confident are you that you can learn this new program on your own?
   - Not confident at all
   - Slightly confident
   - Somewhat confident
   - Fairly confident
   - Quite confident
   - Completely confident

3. Your principal promises full support for any technology that can be linked to the state’s core curriculum standards. How confident are you that you can find technologies to use that will help you meet these standards in your subject?
   - Not confident at all
   - Slightly confident
   - Somewhat confident
   - Fairly confident
   - Quite confident
   - Completely confident

4. Recent legislation, such as the No Child Left Behind Act, stresses the importance of reaching every student, regardless of ability. How confident are you that you can use technology to focus classroom activities on the needs of each learner?
   - Not confident at all
   - Slightly confident
   - Somewhat confident
   - Fairly confident
   - Quite confident
   - Completely confident

5. Unfortunately, your school will not be able to afford a computer lab attendant this year. Instead, each teacher will be assigned two lab hours per week. How confident are you that you can manage your students’ time and activities during these lab sessions?
   - Not confident at all
   - Slightly confident
   - Somewhat confident
   - Fairly confident
   - Quite confident
   - Completely confident

6. At a workshop during a statewide teachers conference you meet several teachers with whom you would like to exchange ideas and experiences during the school year. How confident are you that you can use email, blogs and/or other technologies to keep in touch?
   - Not confident at all
   - Slightly confident
   - Somewhat confident
   - Fairly confident
   - Quite confident
   - Completely confident
7. The parents of more than half your students have asked to be kept informed of class assignments and activities via regular emails or a class website. How confident are you that you can accommodate this request?
   __ Not confident at all
   __ Slightly confident
   __ Somewhat confident
   __ Fairly confident
   __ Quite confident
   __ Completely confident

8. Your district uses computer-based attendance records and an online gradebook. How confident are you that you can use these tools to be more productive?
   __ Not confident at all
   __ Slightly confident
   __ Somewhat confident
   __ Fairly confident
   __ Quite confident
   __ Completely confident

9. A member of the PTA feels that there is too much technology in the school and states that not all technologies are equally applicable to your classroom, and not all student-learning goals are well suited for technology. How confident are you that you can effectively judge when and how to use technology to support your students’ learning?
   __ Not confident at all
   __ Slightly confident
   __ Somewhat confident
   __ Fairly confident
   __ Quite confident
   __ Completely confident

10. In preparation for a performance review with an administrator, you are asked to critically evaluate several aspects of your teaching, including your use of technology in class. How confident are you that you can accurately do so?
    __ Not confident at all
    __ Slightly confident
    __ Somewhat confident
    __ Fairly confident
    __ Quite confident
    __ Completely confident

11. A speaker from the state Department of Education declares that effective teachers are also life-long learners, and that the Internet is a great source of information. How confident are you that you can use the Internet and other technology resources as part of your own lifelong learning?
    __ Not confident at all
    __ Slightly confident
    __ Somewhat confident
    __ Fairly confident
    __ Quite confident
    __ Completely confident

12. Not all of your students will have equal access to technology out of the classroom. How confident are you that you can identify situations where access to technology might be an issue for one or more of your students?
    __ Not confident at all
    __ Slightly confident
    __ Somewhat confident
    __ Fairly confident
    __ Quite confident
    __ Completely confident

13. When some of your students do not have access to technology outside the classroom, how confident are you that you can appropriately, legally, and ethically lessen the effects of such unequal access?
    __ Not confident at all
    __ Slightly confident
    __ Somewhat confident
    __ Fairly confident
14. Your district is focusing on the integration of diversity into the curriculum. The Internet has been suggested as a way to expose students to a wide range of cultures and viewpoints. How confident are you that you can use technology (such as the Internet) to affirm diversity in your classrooms?
   - Not confident at all
   - Slightly confident
   - Somewhat confident
   - Fairly confident
   - Quite confident
   - Completely confident

15. Because students are using the Internet and other technologies in school, they must be instructed how to stay safe while getting the most from these resources. How confident are you that you can model and teach safe usage of technology, including Internet safety?
   - Not confident at all
   - Slightly confident
   - Somewhat confident
   - Fairly confident
   - Quite confident
   - Completely confident

16. Technology can help students accomplish tasks, good or ill. For example, students can find images of rare historical artifacts, but they can also illegally obtain copyrighted materials online (such as music). Telecommunications technology can bring the world into your classroom, and allows students to text one another exam answers via cell phones. How confident are you that you can model and teach ethical and legal use of technology?
   - Not confident at all
   - Slightly confident
   - Somewhat confident
   - Fairly confident
   - Quite confident
   - Completely confident

17. Your school assigns one computer lab period every two weeks to every class, regardless of subject. How confident are you that you can create lesson plans that effectively use the lab time for student learning?
   - Not confident at all
   - Slightly confident
   - Somewhat confident
   - Fairly confident
   - Quite confident
   - Completely confident

18. A teacher in another subject has found an article that reports research on using a certain new technology in class. How confident are you that you can identify the applicable information in the article and use it in your classes?
   - Not confident at all
   - Slightly confident
   - Somewhat confident
   - Fairly confident
   - Quite confident
   - Completely confident

19. An educational software vendor gives a sales pitch to your department. How confident are you that you can evaluate their products for their suitability to your teaching environment?
   - Not confident at all
   - Slightly confident
   - Somewhat confident
   - Fairly confident
   - Quite confident
   - Completely confident
20. A vice principal is upset that the new equipment that was donated to the school is not being used. He asks if you can demonstrate proper usage at the next in-service meeting. How confident are you that you can accomplish this task?
   __ Not confident at all
   __ Slightly confident
   __ Somewhat confident
   __ Fairly confident
   __ Quite confident
   __ Completely confident

21. A parent complains that a unit exam you gave was unfair and poorly written. What’s worse, this parent works at a major standardized testing firm. How confident are you that you can use a spreadsheet program (or another application) to demonstrate the strengths and weaknesses of your test?
   __ Not confident at all
   __ Slightly confident
   __ Somewhat confident
   __ Fairly confident
   __ Quite confident
   __ Completely confident

22. An administrator observes your class’ computer lab and reports to the principal that you are not effectively using that time. How confident are you that you can provide evidence that the time you spend in the lab is effective?
   __ Not confident at all
   __ Slightly confident
   __ Somewhat confident
   __ Fairly confident
   __ Quite confident
   __ Completely confident

The following questions are for demographic purposes. All information provided is confidential and will only be viewed by the researcher of this study.

23. What is your gender?
   __ Female
   __ Male

24. Which category below includes your age?
   __ 20 - 29
   __ 30 - 39
   __ 40 - 49
   __ 50 - 59
   __ 60 or older

25. Which category below includes your years of teaching experience?
   __ 1 - 5
   __ 6 - 10
   __ 11 - 15
   __ 16 - 20
   __ 21 - 25
   __ 26 - 30
   __ 31 or more

Thank you for completing this survey. Your feedback is extremely important.
APPENDIX K

Screenshot of the Permission for Use of the Technology Integration Confidence Scale

Technology Integration Confidence Scale

The goal of the Technology Integration Confidence Scale (TICS) is to be a rigorously developed self-efficacy scale that aligns with the International Society for Technology in Education’s (ISTE) National Educational Technology Standards for Teachers (NETS-T).

Because it is continuously developed, the TICS will have several versions available for download on the left.

Please refer questions and comments to Jeremy Browne at jbrowne@brockport.edu.

Frequently Asked Questions

What does the TICS measure?

Which standard of “technology integration” was used to build the TICS, or did you use your own?

Do I need permission to use the TICS?

How is the TICS administered?

How is the TICS scored?

Why not score TICS responses with a Rating Scale Model or another more complex analysis, rather than a simple average?

Should TICS users worry about respondents dishonestly reporting (inflating) their confidence level?

Why aren’t there any published standardized score for the TICS?

What validity evidence has been gathered to support the use of the TICS?

Is the TICS still under development?

Are there any known issues with TICS v2?

What does the TICS measure?

The TICS measures self-efficacy as defined by Bandura (1977, 2006), which is a well-defined psychological trait, similar to the vernacular term confidence. Self-efficacy is task-specific, meaning that a person may exhibit high self-efficacy on one task, and low self-efficacy on another. The tasks presented in the TICS concern effective technology integration (students and teachers using technology during instruction).

Which standard of “technology integration” was used to build the TICS, or did you use your own?

The tasks presented in the TICS are aligned with the National Educational Technology Standards for Teachers (NETS-T), as published by the International Society for Technology in Education.

Do I need permission to use the TICS?

No. The TICS has been released under the Creative Commons Attribution, Share Alike license. This means that you can reproduce and use the TICS as much as you like. You can even make changes to it. However, the license stipulates two things: 1) You must give attribution to Jeremy Browne as the original creator of the scale, and 2) if you alter the TICS, the resulting scale must be released under the same license. (It would also be good of you to let me know how you’re using the TICS and what I could do to make it better.)

TICS Forms

TICS v3

Development is beginning on the third revision of the TICS. This version will be aligned with the NETS-T 2008, and will be piloted in at least four teacher education programs. Want to help? jbrowne@brockport.edu

TICS v2

(Posted 4/2/07)
.doc format
.pdf format

TICS v1

(Posted 10/24/06)
.doc format
.pdf format

Presentation Slides

SITE 2009
AERA 2008
SITE 2008
SITE 2007
APPENDIX L

Screenshot of the Permission for Use of the Observation Protocol for Technology Integration in the Classroom