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Doctor of Education in Organizational Leadership

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A Descriptive Qualitative Study
Exploring Middle-School Teachers' Perceptions of Professional Development
on Technology Integration

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of the requirements for the degree of
Doctor of Education in Organizational Leadership

by
Dayana Núñez
February 2023

Acknowledgments

This work was for my Heavenly Father, my Lord and Savior Jesus, and the Holy Spirit; You were my source of strength, “With man this is impossible, but with God all things are possible” (Matthew 19:26, NIV).

My mother Nereida Núñez taught me at a very young age the importance of education. My aunt Milagros Almonte, my second mother, supported my desire to pursue higher education. My siblings Mayra, Michael, Josie, my nieces and nephew, for being courageous and a gift from God.

For my children Bella and Benjamin, thanks you for patiently waiting for my undivided attention. Please accept my apology for so many nights of going to bed without me. You are very important to me and everything I have done has been with you in my heart and thoughts.

Heather Westerfield, for being persistent, helped me through the application process and taught me this was possible.

Dr. Leah Wickersham-Fish, who accepted to be my dissertation chair, was an extraordinary professor. She has worked tirelessly from coursework to the present so patiently. She recommended that I attend the “Three Approaches to Qualitative Data Analysis” workshop with Johnny Saldaña, and this helped me tie everything together. I couldn’t have done this without your guidance.

Dr. Dana McMichael, thank you for being so sweet, encouraging, and knowledgeable. I also want to thank my dissertation committee: Dr. Christie Bledsoe, Dr. Darin Martin, and Dr. Julie M. Lane for accepting to be part of the dissertation committee and taking time out of your busy schedules to give me great feedback to improve my research study.

Dr. Linnea Rademaker, thank you for always being so knowledgeable throughout all my years pursuing my doctorate. I also thank Dr. Scott, Dr. Kathy Yeager, and the panel of experts for teaching me the importance of asking the correct questions in collecting rich data. You are all a phenomenal group of professionals.

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Abstract

Today's teachers are being encouraged to incorporate technology into their classrooms. Technology integration became a worldwide focus for schools after remote learning was necessary to continue instruction due to the COVID-19 pandemic. Additionally, research shows that technology-infused lessons improve student achievement and increase student engagement. Despite efforts to support teachers throughout the technology integration process, concerns have developed. Preparing highly qualified teachers ready to incorporate technology into their teaching repertoire has developed additional stress factors. In this descriptive qualitative study, the researcher wanted to address the problem of teacher attrition, possibly related to stress factors associated with technology integration. The purpose of this qualitative descriptive study was to explore teachers' perceptions of professional development opportunities that possibly improve the technology integration process. Additionally, the researcher wanted to identify stress factors associated with technology adoption and how professional development may help to reduce stress factors associated with technology integration in one middle school in New York. The researcher chose a qualitative descriptive study using Vygotsky's social constructivist theory and Bandura's social learning theory on self-efficacy as the theoretical framework. The researcher included an exposition of the literature sources, synthesized the research findings, and provided recommendations for practice and future research. The data collection process consisted of semistructured open-ended questions that were developed with the support of a panel of experts. There were 10 participants chosen using a snowball sampling strategy. This study's findings were that professional development should be hands-on, continuous, and targeted to increase teachers' personal level of engagement. Also, creating opportunities for colleague support systems reduced stress factors associated with technology integration. These peer support

systems reduced the time required to research the most effective resources, digital tools, and applications as participants shared the resources with one another. Recommendations for practice included providing adequate professional development, offering appropriate infrastructure, and hands-on, targeted, continuous training for teachers to feel more comfortable developing technology-infused lessons. Recommendations for research include providing additional insight into teachers' perceived benefits and motivation for technology integration and how stress factors associated with the technology adoption process possibly increase teacher attrition.

Keywords: stress factors, technology integration, professional development, teacher perceptions, constructivism, self-efficacy

Table of Contents

Acknowledgments.....	i
Abstract.....	iv
List of Tables	viii
Chapter 1: Introduction.....	1
Background.....	2
Statement of the Problem.....	3
Purpose of the Study	5
Research Questions	6
Definition of Key Terms.....	7
Chapter 2: Literature Review	9
Literature Search Methods	9
Literature Review.....	10
Technology in the Classroom	10
Technology Integration.....	11
Professional Development	17
Leadership Body's Influence on Technology Integration	20
Theoretical Framework Discussion	26
Constructivism	27
Professional Development as Related to Constructivism	28
Social Learning Theory.....	30
COVID-19 Pandemic.....	30
Gap	31
Summary	31
Chapter 3: Research Method.....	33
Research Questions	34
Research Design and Method	34
Population	34
Study Sample	35
Materials/Instruments	35
Data Collection and Analysis Procedures.....	36
Data Collection	36
Data Analysis	37
Validity and Reliability	38
Ethical Considerations	40
Assumptions.....	41
Limitations	42
Delimitations.....	42
Summary	43

Chapter 4: Results	44
Research Questions	47
Themes Developed From RQ1	47
Theme 1: Professional Development Should Be Hands-On, Continuous, and Targeted	47
Theme 2: Teacher Buy-In Improves Through Professional Development	56
Themes Developed From RQ2	60
Theme 3: Identified Stress Factors Associated With Technology Integration	60
Theme 4: Impact of Resources on Stress Factors Associated With Technology Integration	63
Themes Developed From RQ3	67
Theme 5: Collaborative Professional Development Reduces Stress	68
Summary	72
Chapter 5: Discussion, Conclusions, and Recommendations	73
Discussion of Findings in Relation to Past Literature	73
Findings From RQ1	74
Findings From RQ2	76
Findings from RQ3	78
Limitations	80
Recommendations	81
Recommendations for Practice	81
Recommendations for Future Research	84
Conclusions	85
References	89
Appendix A: Interview Protocol	104
Appendix B: IRB Approval	108

List of Tables

Table 1. Demographics of the Participants in the Semistructured Interviews	46
Table 2. Theme 1: Hands-On, Continuous, Targeted	48
Table 3. Theme 2: Professional Development That Improves Teacher Buy-In	56
Table 4. Theme 3: Stress Factors	61
Table 5. Theme 4: Impact of Resources	64
Table 6. Theme 5: Collaboration	68
Table A1. Data Collection Matrix	104
Table A2. Expert Panel Qualifications	106

Chapter 1: Introduction

Teachers are instrumental in developing our society's professionals. Educators are responsible for staying current with the most effective teaching practices and methods available to impart the subject knowledge to their students. In the past decades, researchers have found an increase in teacher turnover rates, and a shortage of qualified teachers has developed (Oke et al., 2016). Every year, the department of education spends several billion dollars to alleviate issues related to teacher turnover throughout the United States (Morettini, 2016; Saeki et al., 2018). Today's teachers are being confronted with the need to implement technology in their classrooms. Despite efforts to support teachers through technology integration, the technology integration process has produced other concerns. Preparing highly qualified teachers ready to incorporate technology has become another problem (Mitchell et al., 2017).

Educators without appropriate support from administrators or adequate professional development opportunities or resources possibly suffer from stress factors that may make it difficult for them to stay in their teaching positions. Teacher attrition is a problem that costs the government money and sometimes forces school administrators to put novice teachers that are not properly trained into the classroom prematurely and continue the attrition cycle (Baxter & Jack, 2008; Player et al., 2017). When schools do not retain highly qualified teachers, it may negatively impact the learning community. Player et al. (2017) found that principals should focus their efforts on creating policies and providing continued support to retain highly qualified teachers that are good for the positions. Furthermore, the principals need to clarify the type of school they would like to operate alongside effective communication of those expectations. Principals would benefit by occupying the positions with teachers that are well-equipped to teach using technology if it essential for their learning community. Player et al. (2017) also shared that the leadership body could predict teachers' intentions to stay in their school and possibly reduce

costs associated with teacher attrition. Furthermore, principals should focus their efforts on creating policies and providing continued support to retain the highly qualified teachers through professional development (PD) opportunities (Wambugu, 2018).

Providing appropriate support through PD may reduce stress factors and possibly increase teacher retention. Our educational system is constantly changing to help improve our educational process. One way that the educational system has aimed to improve over the past decade is through the incorporation of information and communication technologies (ICTs; Amnat et al., 2019). Although ICTs have improved student performance, it comes with additional stress factors through technostress possibly caused by technology overuse. Techno-stressors can lead teachers to feel distressed, as the school climate can influence teachers' experiences (Seechaliao, 2017). The leadership body and lack of appropriate PD opportunities can create a climate that may contribute to the existence of techno-stressors and develop distress and work exhaustion (Gaudio et al., 2017). More information on teachers' perception of technology is important and why or why not it is to be considered a valuable tool for the learning process.

Background

Our world is changing rapidly. To keep up with these changes, the use of technology is an important innovation that the educational system has incorporated into the classrooms. Learning through technology is now becoming a prevalent resource in the educational process (Seechaliao, 2017). Although technology offers students a wider range of resources that improve instruction, proper training is important for teachers to use technology more effectively. Inappropriate preparation can possibly cause stress factors among teachers (Harmsen et al., 2018). Today's educators have been forced to use technology in the classroom and to engage their students through the remote learning process due to the COVID-19 outbreak.

Often, teachers who do not have appropriate PD experiences related to the incorporation of the technology feel overwhelmed. There has been an increase in research studies about factors affecting technology integration in the classroom (McCulloch et al., 2018). Factors that may affect technology integration can be classified as external and internal barriers (Vongkulluksn et al., 2018). Diffusion of technology can be slowed down through these barriers (Koster, 2017). One barrier is that there may not be enough teacher buy-in of technology integration due to poor PD. Another would be stress associated with the technology integration process that may come from poor self-efficacy and feeling inadequate, which can also come from poor preparation.

Equipping teachers through PD on best practices for using technology in the classroom is necessary for them to feel prepared with relevant information and resources. PD opens teachers to new strategies, improved pedagogical knowledge, and other skills that may improve performance among the learning community (Postholm, 2018). For PD sessions to be most productive, it is important to include collaboration among colleagues, provide opportunities for them to reflect on current practices, know desired outcomes, ensure ongoing support, have a planned-out duration or possibly repetition of training opportunities, and promote active participation from learners (McComb & Eather, 2017; Powell & Bodur, 2019; Williams, 2017). Teachers' perception of PD opportunities is also important to motivate and engage teachers (Liao et al., 2017). Powell and Bodur (2019) called for more research on teachers' perceptions of PD.

Statement of the Problem

Technology is an important innovation incorporated in today's classrooms to improve student performance (Amnat et al., 2019; Durak & Saritepeci, 2017; Masullo, 2017). However, technology integration has produced problems for school administrators (Koster et al., 2017; Hoffman & Ramirez, 2018; Xu et al., 2017). The leadership body must perform changes to infrastructures, provide appropriate digital resources, and organize training programs to

productively integrate technology in the classroom (Amnat et al., 2019; Hsin-Hsiange & Mao-Neng, 2015; Koster et al., 2017). Experts have explored the relationship among the members of the professional learning community (PLC) that incorporate the stakeholders' opinions to improve buy-in, school facilitation, and implementation of information and communication technology (Masullo, 2017; Raman & Shariff, 2017).

Contemporary researchers found that teacher shortages and teacher attrition have increased in the past decades due to stress factors (Green & Muñoz, 2016; Player et al., 2017). Some stress factors are associated with a lack of preparation to adopt the technology through the implementation process (Janik & Rothmann, 2015; Thannimalai & Raman, 2018). However, research shows that teachers have not received proper training, and that some principals do not have proper formal in-service training to support the technology diffusion process (Garcia & Abrego, 2014; Zhong, 2017). Claro et al. (2017) theorized that productive diffusion of technology is produced through collaboration among the faculty and administration. Furthermore, researchers have found that productive technological teaching practices are developed through PD (Amnat, 2019; Armstrong, 2019; Janik & Rothmann, 2015), where the leadership body takes into consideration the social and cultural aspects of the stakeholders to stimulate communication about change (Claro et al., 2017; Get, 2018; Thannimalai & Raman, 2018). A way to effectively stimulate these communications is through a bottom-up approach where the leadership body encourages broader employee involvement regarding suggestions for improving the working process for problem resolution and encouraging a proactive approach (Get, 2018). However, principals that have different views from those of the stakeholders may slow down the adoption process and implementation of the technology (Garcia & Abrego, 2014; Koster et al., 2017; Nelson et al., 2019). The potential stress factors associated with the technology integration process coupled with a lack of PD that may improve technology adoption

are the specific problems addressed in this study. In some cases, teachers may not know how to implement technology and not adopt technology as soon as the leadership body would like (Wang et al., 2014). Administrators may not want to approve or invest in PD suitable for proper technology integration (Lindvall & Ryve, 2019). Thus, the problem is to explore teachers' perception of PD that possibly improve the technology integration process, identify stress factors associated with technology integration, and how PD can reduce technostress. The results of this study's research, if implemented, may help reduce teacher attrition, may provide a better investment of money in teacher preparation, and may help develop a more effective process for technology integration (Nicoletti et al., 2020).

Purpose of the Study

The purpose of this qualitative descriptive study was to explore teachers' perceptions of PD that possibly improves the technology integration process. Additionally, I wanted to identify stress factors associated with technology adoption and how PD may help to reduce stress factors associated with technology integration in one middle school in New York. This type of inquiry could improve diffusion of technology in classrooms, support technology adoption in schools, and possibly reduce stress factors associated with the technology integration process to improve teacher retention.

As schools seek to improve student performance, technology incorporation is now at the forefront of the learning process. The recent coronavirus pandemic, the COVID-19 outbreak, has grown the need for technology integration to provide students with educational support. The need for technology in schools skyrocketed in light of the pandemic (DeVaney et al., 2020). For students' academic progress to have continuity, it was necessary to incorporate remote learning. On the bright side, the one middle school selected for this research study had the infrastructure in place for successful integration for the mandatory remote learning. Also, Griffiths (2020)

observed a need for technology integration, especially during a pandemic, since it has become the only way for students to continue their educational journey. Providing appropriate evidence-based recommendations about the diffusion of technology process and factors that may improve the perception of the importance of technology can possibly provide actionable change to support the learning community. As such, this study offered the opportunity to upgrade teachers' level of preparation and improve their relationships with the leadership body and ease the burden of stress factors related to work (Kabito & Wami, 2020).

Research Questions

The purpose of this qualitative descriptive study was to explore teachers' perceptions of PD that could improve the technology integration process. Additionally, I wanted to identify stress factors associated with technology adoption and how PD may help to reduce stress factors associated with technology integration in one middle school in New York.

Teacher stress possibly leads to mental health issues (Katz et al., 2018), increases teacher burnout, and may negatively impact teacher retention (Ryan et al., 2017). Coping with stress is vital to the persons' overall well-being (Lazarus & Folkman, 1987). As such, this qualitative descriptive study sought to answer the following questions:

RQ1: What type of professional development influences middle-school teachers' perceptions of technology integration?

RQ2: Which stress factors are associated with technology integration in the classroom?

RQ3: How can professional development reduce the stress associated with technology adoption for middle-school teachers?

These questions guided the selection of the research design, theoretical framework, selection of the appropriate methodology, sample selection, data collection process, and data analysis approach to provide an appropriate basis for conducting the research and report the results.

Definition of Key Terms

Burnout. Refers to a person feeling overwhelmed, being frustrated, experiencing disappointment, and/or not being motivated to continue to work (Herculano et al., 2018).

External barriers. External barriers correspond to the availability of hardware, software, administrative support, and PD about technology (Koster et al., 2017).

Information and communication technologies (ICTs). The procedure or practice to use technology in education to improve student learning and other teaching methods. ICTs enhance learning by providing skills reaching more students with online courses, automating regular day-to-day tasks, and improving the administration of efficiency through lessons delivery support (Obielodan et al., 2020).

Information technology (IT). The definition describes it as the use of computers to communicate, study, store, and manipulate information (Donkaew et al., 2019).

Internal barriers. Internal barriers have to do with teachers' attitudes and beliefs about the importance and benefits of technology (Koster et al., 2017).

Professional development (PD). PD is the process of teaching stakeholders knowledge, skills, use resources, and preparation for tasks that they are required to implement in the workspace. (Bates & Morgan, 2018). PD is used to provide professional training to improve the person's competence, knowledge, and performance through continued support in a broad range of topics and formats (Wambugu, 2018).

Professional learning community (PLC). A professional learning community is one where stakeholders collaborate to produce meaningful dialogue that will develop teacher growth (Swanson et al., 2018).

Remote learning process. Remote learning allows teachers and students to continue engaging with the content while working from home. Remote learning is typically provided in emergency situations that pose a threat to students' safety (Ray, 2020).

Technostress. Distress caused by constantly working with computer technology (Gaudio et al., 2017).

Chapter 2: Literature Review

There has been a shift from traditional teaching methods to more advanced approaches using technology. Technology has become a significant resource implemented in today's classrooms to improve student achievement and increase student engagement. Creating a 21st-century learning environment in our educational system has shown to be necessary if we are to keep growing as a community of learners. However, integrating technology has shown to have its challenges. Armstrong (2019) found that additional stress factors have developed among the learning community due to the growing demands of incorporating technology.

I designed this qualitative descriptive study on PD to influence teachers' perceptions of the technology integration process in one low-income middle school in New York. I investigated what other researchers found. The goal was to identify research studies related to technology integration in the classroom, PD that possibly alleviates the technology integration process, and to identify possible stress factors associated with the adoption process to further identify how they affect teacher attrition. The purpose of this qualitative descriptive study was to explore teachers' perceptions of PD that could improve the technology integration process. Additionally, I wanted to identify stress factors associated with technology adoption and how PD may help to reduce stress factors associated with technology integration in one middle school in New York.

Literature Search Methods

The resources discovered for the literature review presented in this chapter came from peer-reviewed journal articles and books. I used the Abilene Christian University Library website to access most sources using the EBSCO Host research platform. Other sources included ERIC and SAGE. I searched using multiple combinations of the following terms as keywords and phrases: *technology integration*, *teacher attrition*, *professional development*, *teacher*

perceptions, using technology to support learning, leadership support, constructivism, and social learning.

Literature Review

Technology in the Classroom

Information technology (IT) is now a major part of the 21st-century classroom (Durak & Saritepeci, 2017). Technology has developed changes to the educational system through infrastructure, digital resources, and training programs developed to affect today's classroom positively (Hoffman & Ramirez, 2018). Today's classrooms need technology to raise individuals' competencies necessary for being a member of 21st-century society.

Benefits of Using Technology in the Classroom. Technology has increased the effectiveness of students' education (Stanley, 2013). Researchers have examined how technologies have affected learning (Zhong 2017; Rumschlag, 2017). Providing technology as a resource in the classroom has shown improvements in student achievement and engagement. Technology integration within the curriculum helps both teachers and students, providing teachers with the opportunity to transform the traditional classroom into an engaging learning environment that promotes a more independent learning program (Zhuang & Xiao, 2018). Durak and Saritepec (2017) shared how technology improves classroom management to increase the learning process efficiency, reach educational goals, and transform traditionally dull subjects into interactive and fun activities. Integrating technology into our lesson plans expands not only our students' knowledge but the teachers' knowledge as well. A broader set of resources on the subject matter can make a significant difference in the classroom.

Research suggests that technology's role has the potential to substitute faculty, playing a significant part in the students' learning process (Schaefer et al., 2014). When faculty-student interactions are not possible because they cannot meet, for instance, remote learning due to

COVID-19, educators should adopt technologies that are both instructional and enjoyable. Through the use of technology, the disadvantages may be lowered for all types of students due to the opportunity provided to access many more resources (Seechaliao, 2017). Schaefer et al. (2014) found a more considerable difference in performance for students of low-income communities compared to their advantaged peers when using technology in the classroom.

Technology as a Facilitative Teaching Approach. Technology is helpful in creating a more individualized learning approach (Zhang et al., 2021). Technology integration allows students to select their assignments through a menu of digital resources and receive real-time feedback on their progress instead of having to wait for the teacher. Teachers have found an increase in students helping each other through technology in the classroom (Schaefer et al., 2014). Many technology-based tasks allow students to interact with others (Zhang et al., 2021). Additionally, when students are working in small groups, more technologically advanced students can help assist others.

Preparation for the Future. Today, every professional must use technology in some manner (Raman & Shariff, 2017). Technology in the classroom can help prepare students for future jobs and college readiness (Wise, 2017). To prepare students for the future, teaching students skills like Word, PowerPoint, Docs, among other digital resources, can help set our students up for success (Lee, 2020). Promoting to work collaboratively using technology enhances active learning, a positive attribute necessary for the working environment.

Technology Integration

Technology integration improves the learning process and increases student achievement and creativity level (Ucus & Acar, 2018). Zhang et al. (2021) found that for creativity to flow, student independence is essential, fostering cooperation and motivation through a nonjudgmental environment that shows flexibility. Some students are tech-savvy and are comfortable with

technology. Most students in the United States are exposed to technology from an early age, and it is part of their daily lives, whether through their phones or tablets (Wise, 2017). Although technology is seen as a favorable resource by many people, other variables affect the implementation of technology in the classroom (Wood et al., 2018). Some teachers may not feel comfortable enough to adopt the technology, may not know how to incorporate technology productively for instruction, and may have perceived barriers in the use of the technology.

Technology integration in the classrooms may not be a comfortable process for everyone. Some teachers immediately desire to work with the technology in their classrooms; for others, it will be a long process. Ucus and Acar (2018) argued that for teachers who are innovators, they are usually willing to lead in the incorporation of the technology and promote the integration to others. Research studies have identified many advantages of using technology in the classroom (Zhong 2017; Rumschlag, 2017). However, the relative advantage of technology in the classroom should be demonstrated to all the teachers (Stanley, 2013). The complexity of the technology and digital resources will also determine how quickly the teachers may adopt the technology in their classroom (Wood et al., 2018). The younger generation of teachers may not have a problem with integrating technology into their teaching. However, the older teachers may require PD to alleviate their level of fear and possible frustrations (Zhuang & Xiao, 2018).

Importance of Trialability. The trialability of the technology is essential for teachers to explore ideas and to discover ways to use the technology in their classroom. Technology can be adopted quicker if introduced properly (Xu et al., 2017). Although the students may be comfortable with technology, the teachers need to become familiarized and comfortable with the technology; this way, their role as a leader in the classroom is not in question, and they are more likely to commit to the adoption (Zhuang & Xiao, 2018). Additionally, having teachers observe other educators use the technology to see how they would possibly benefit from using

technology in their classroom is one way to potentially improve adoption of technology (Swanson et. al, 2018). Through PD, preparation to use technology productively may be possible. These resources may allow a more positive reaction toward the adoption process (Xu et al., 2017). Administrators should provide teachers with a variety of resources for them to perform self-evaluations and ask questions (Williams, 2017). Also, open communication is warranted to identify areas where teachers need and would like to receive PD.

The leadership body should acknowledge that educators have valid concerns about implementing technology in their classrooms, especially the teachers accustomed to more traditional teaching methods and strategies (Wang, 2018). Administrators need to provide teachers with PD that exposes them to the technology and explores additional possibilities from the digital resources (Paulus, 2020). Regardless of the way the leadership body chooses to expose their teachers to the technology, there needs to be some type of PD available for teachers for the adoption process to flow smoothly (Wieczorek, 2017). Today, educators have been encouraged or forced to modify their classroom practices to accommodate technology into their instruction (Wood et al., 2018). The problem is that not all pedagogues have had the appropriate level of preparation, and technology integration possibly causes additional stress before realizing how successful technology integration can be for the learning community (Al-Fudail & Mellar, 2008). Furthermore, teachers need to buy into the importance of technology integration in the classroom before they can evolve from more traditional teaching practices into a more facilitative role (Wood et al., 2018).

Factors That Support Effective Technology Integration. Vongkulluksn et al. (2018) shared that there are external factors that support effective technology integration. Some of these factors are appropriate infrastructure, adequate quantities of technological tools, appropriate digital resources, and effective PD opportunities. Additionally, internal factors also support

technology integration (Vongkulluksn et al., 2018). Internal factors, such as teacher self-efficacy and their perception of technology's ability to improve instruction, may improve the integration of technology and possibly reduce frustration (Koster et al., 2017; Vongkulluksn et al. 2018). However, technology integration continues to be a challenge (Xu et al., 2017).

Adequate technology implementation in classrooms requires for the leadership body to play an active role in considering the key factors of appropriate infrastructures, provision of adequate technology, sufficient technological resources, appropriate PD, and teacher self-efficacy for improved teacher perceptions (Thannimalai & Raman, 2018). In order to create learning environments that promote appropriate use of technology, the leadership body should identify possible challenges teachers may face before they can successfully integrate technology into their current pedagogical repertoire (Wood et al., 2018). Many teachers are “digital immigrants,” being taught using a traditional approach and have been delivering instruction in the same manner. Most of the experienced teachers did not grow up in a world surrounded by technology (Xu et al., 2017). Therefore, these educators are learning and adapting to the technological advances. However, educators need to become more prepared to meet the needs of their 21st-century learners (Wood et al., 2018). Teachers need to ensure they are preparing their students for their future roles in society (Nelson et al., 2019).

Today's teachers cannot remain stuck in the past using traditional teaching methods (Paulus, 2020). The leadership body needs to provide the extra support and give their teachers an extra “push.” There is plenty of technology available, and administrators need to be proactive in facilitating a productive integration of technology. Technology integration can be overwhelming for a digital immigrant (Xu et al., 2017). Without a proper flow, there can be a delay in the technology integration process. Furthermore, a lack of understanding of using technology productively hinders teachers' ability to incorporate it into their classroom (Thannimalai &

Raman, 2018). PD must also be provided in order to educate the teachers properly. Before teachers can instruct their students in preparation for the technological world, educators must be properly educated on how to use the technology, especially since technology may become the primary resource in today's classrooms (Xu et al., 2017).

Reasons to Incorporate Technology in the Classroom. Technology integration seeks to improve the classroom dynamics and improve instructional delivery. Technology integration in the classroom has been shown to improve student engagement and positively impact classroom management (Günes & Buluç, 2018; Ipek & Ziatdinov, 2017). The importance of incorporating technological innovations in the classroom is to improve teacher instruction and students' preparation. Adopting the technology fosters the development of a wider range of resources to promote creativity and innovation in the classroom compared to more traditional teaching approaches (Ucus & Acar, 2018). Having technology in the classroom allows teachers to provide students with supports that would typically not be available. Students have access to instructional tools, videos, and a broader amount of information. These types of resources allow students to be more engaged, promoting improved classroom management, which are just a few reasons to incorporate technology in the classroom (Amnat et al., 2019).

Productive Technology Integration. When the leadership body can portray to their teachers the importance of technology, there is a more successful adoption rate (Claro et al., 2017). Also, teachers that feel supported by their administrators experience lower stress levels (Thannimalai & Raman, 2018). Lowering stress factors associated with the technology integration process is vital for the administrators; the adoption rate can be more productive, and the leadership body's goals accomplished (Chen, 2020). When teachers' perceptions are favorable regarding technology integration and seen as improving classroom management due to student engagement, they are more open to adopting the technology (Ipek & Ziatdinov, 2017).

However, other problems arise when incorporating technology in the classroom. Lack of preparation, both of infrastructure and inadequate PD, may cause external and internal barriers. These barriers possibly lead to issues that can cause technostress (Vongkulluksn et al., 2018). Some researchers have found that stress factors are associated with teacher attrition (Hoffman & Ramirez, 2018).

Nelson et al. (2019) found the following:

Teacher education literature that focuses on technology reveals that preservice teachers should be trained in an environment where they learn to value how technology will help them perform their jobs as teachers better, where they feel that they are personally capable of using the technology, and where their instructors and mentor teachers view technology as useful and demonstrate that through modeling. (p. 331)

Nelson et al. (2019) examined how teachers develop the desire to incorporate technology into their teaching. The authors found that these intentions were developed through proper training by modeling, fostering collaboration, and providing support from a skilled mentor. Mentors usually get assigned to new teachers; however, experienced teachers new to technology integration would benefit from the opportunity. Research shows that providing appropriate tools, hardware, digital resources, and continuous PD are needed to integrate technology in the classroom effectively (Koster et al., 2017). In examining barriers, some include teacher refusal and those that tend to challenge the authorities (Vongkulluksn et al., 2018). Simultaneously, other teachers may not be willing to accept technology integration as a tool for classroom instruction. However, the predominant barrier to technology integration in the classroom is the lack of teacher preparation or PD (Sariyildiz, 2017). Teachers may feel comfortable using technology for administrative or personal purposes but not for delivering instruction. Günes and Buluç (2018) state that there is not enough teacher preparation regarding how to incorporate

technology into their lessons. There is lack of pedagogical preparation and curriculum training to support technology integration (Sariyildiz, 2017). Previous studies have found that targeted PD helps technology integration as a teaching and learning tool (Özgür, 2020).

Professional Development

PD is a crucial component of today's school improvement initiatives (Wieczorek, 2017). PD is a strategy used by schools to improve teachers' performance levels (Wang, 2018). Educators improve the quality of their teaching practices through PD (Donnelly & Maguire, 2021). Sariyildiz (2017) posited that schools could not improve if their educators are not improving their skills and abilities. Teachers are often not prepared for the teaching responsibilities that they are expected to perform (Günes & Buluç, 2018).

PD has traditionally consisted of short-duration workshops or conferences (Bates & Morgan, 2018). Short-term PD programs are less effective for teacher preparation and lack productivity when teaching and learning. Short-term PD programs do not allow adequate time for teachers to practice the concepts learned and are not very effective in changing teaching practices (Sariyildiz, 2017). Donnelly and Maguire (2021) argued that due to the limited value of short-term PD opportunities and the lack of subsequent follow-up sessions, they provide minimal impact on instructional practice. Peer mentoring is a more effective nontraditional approach consisting of teachers observing other teachers and collaborating through discussions about the diverse strategies observed (Zhong, 2017). Continuous PD is another effective approach. These PD opportunities are an ongoing process of developing and maintaining professional skills learned through formal courses or peer mentoring (Wang, 2018).

Professional Development Models. Teachers' PD opportunities should consist of a variety of models (Sariyildiz, 2017). Raman and Shariff (2017) determined that culture,

collaboration, and personal experiences, including workshops and coursework, serve as more effective PD approaches. For example, short-term, one day training sessions do not provide enough support for the teacher. A key component in many studies of teacher PD is to include stakeholders' opinions on the type of PD they need to improve their practice (Sariyildiz, 2017). One study found several characteristics of PD that teachers would like to receive, including teacher needs, teacher involvement in the design/planning of PD activities, active participation opportunities, long-term engagement, and high-quality instructors (Donnelly & Maguire, 2021).

Teachers' PD that provides pedagogical support to encourage technology usage in the classroom should be enriched with resources of instructional practices through technology (Schrader, 2015). The administrators' objective for developing a PD opportunity should allow reflection and collaboration among the educators. These PD trainings should provide critical-thinking and problem-solving opportunities (Paulus, 2020). PD activities have evolved from only providing workshops to include a more collaborative approach and formal coursework (Donnelly & Maguire, 2021). PD seeks to provide teachers with the knowledge and skills needed to impact instructional delivery and improve student achievement productively.

Professional Development as Support. PD should be a priority for principals, both for their personal growth and their teachers (Wang, 2018). When appropriate support systems are provided for the learning community the technology adoption process also improves (Sariyildiz, 2017) and opens communication among the stakeholders (Wang, 2018). Low levels of communication and collaboration produce frustration and confusion among the learning community members (Zhong, 2017). Stakeholders must become informed and feel supported by the leadership body to develop a genuine interest in a shared vision. Shared vision improves how productively a new technological strategy is adopted and improves the conditions for integrating the strategy into school practices. Consequently, when the leadership body allows for an

identification of their teachers' perceptions of those new technological proposals, more effective strategies for the integration of the new technologies can be adopted (Claro et al., 2017).

PD is an essential factor in the technology adoption process necessary to identify the areas where the stakeholders need extra support (Swanson et al., 2018). Some stakeholders may need distinct types of PD (Williams, 2017). Therefore, differentiation is necessary to ensure appropriate allocation of resources (Song & Choi, 2017). The effects of the distinct types of technological resources available should be explored and learned to improve classroom interactions. Additionally, the types of technological resources should also be taken into consideration when selecting appropriate PD opportunities. More effective technology integration needs effective collaboration among the school leaders and the teachers. Collaboration among the stakeholders improves the learning process (Claro et al., 2017). Changes in traditional teaching practices need to be considered by the new strategies of technological implementation in the classroom. Not understanding how these new strategies support instruction does not promote appropriate innovation conditions to be adopted productively.

Exploring the importance of creating the conditions for a shared view by every member of the learning community allows the leadership body to efficiently promote technology adoption, which should be a priority (Soleman & Danaiaata, 2018). Fostering a shared vision through the school administration's support improves the perceptions and beliefs of every stakeholder. Stakeholder perceptions and beliefs should be aligned with the vision to create the conditions necessary for successfully implementing technology (Soleman & Danaiaata, 2018). Therefore, school members' beliefs and attitudes should align with those of the leadership body to correctly integrate technology (Claro et al., 2017).

On the other hand, when school principals and their teachers have different views, it may become a significant obstacle that may get in the way of the implementation of the technology, and the rate of adoption tends to slow down (Soleman & Danaiaata, 2018; Williams, 2017). The teacher's beliefs and attitudes need to be aligned with those of the school principal for the process of technology integration to be more productive. Frequently, for teachers who do not have appropriate PD opportunities where they can experience this type of collaboration, incorporating the technology may leave them feeling overwhelmed (McCulloch et al., 2018).

Leadership Body's Influence on Technology Integration

School principals, alongside their administrators, affect the school culture's development (Hsin-Hsiange & Mao-neng, 2015). Hsin-Hsiange and Mao-Neng (2015) argued that administrators' personal traits and behaviors directly impact a school's atmosphere. Appropriate relationships are interdependent where the leadership body and the teachers rely on each other for mutual support. The stakeholders' relationships need to shift from one of alienation to a more collaborative approach (Swanson et al., 2018). It is vital to foster a relationship where trust is developed and open communication is promoted in order for stakeholders to take ownership and feel that their opinions matter and are valued as an essential member of the community (Wang, 2018).

When teachers feel valued, they are more open to adopting the technology brought forth by the leadership body (Wang et al., 2014). However, the school administrators need to be supportive and open to the influence produced from collaboration among the leadership body and the teachers (Torres, 2016). This type of relationship should be sought to ensure that the technology integration process is both productive and enjoyable (Thannimalai & Raman, 2018). Masullo (2017) posited that there should be a person responsible for the technology integration process. Masullo shared that there should be a person in the learning community that can become

the leader of the support system for there to be an effective use of technology that will improve the integration process and improve student performance. Additionally, there should be an incorporation plan that will be revised periodically, where training and support be provided for the learning community as a whole (Masullo, 2017).

Pedagogues should understand school principals' vision for there to be success (Torres, 2016). Principals need to share their vision and ideas to every stakeholder. The vision must become clear, and administrators need to create opportunities for collaboration if they would like the desired outcome to develop (Swanson et al., 2018). Also, teachers need to buy into the vision if they are going to work toward its accomplishment. This type of relationship should be sought after to ensure that the technology integration process is both productive and enjoyable (Thannimalai & Raman, 2018). Masullo (2017) posited that there should be a person responsible for the technology integration process. Masullo shared that there should be a person in the learning community that can become the leader of the support system in order for there to be an effective use of technology that will improve the integration process to improve their students' performance. Additionally, there should be an incorporation plan that will be revised periodically, and that training and support need to be provided for the learning community as a whole (Masullo, 2017).

Additionally, pedagogues should understand school principals' vision (Torres, 2016). To see success as a leader, principals need to share their vision and ideas. The vision must be made clear to every stakeholder to work collaboratively to develop the desired outcome (Swanson et al., 2018). Teachers need to buy-into the vision to work toward its accomplishment. When technology integration is part of the administrators' vision, providing every stakeholder with the why they are working to incorporate technology in the classroom, it improves the adoption (Thannimalai & Raman, 2018). Administrators significantly impact teachers' performance based

on data analysis (Player et al., 2017). The leadership body may positively or negatively influence their teachers (Song & Choi, 2017). Through collaboration, principals and teachers develop open communication where they can build on open relationships, producing empathy among stakeholders to achieve the desired outcome. When stakeholders come into agreement and work together, the culture of the organization also improves. A school culture that conducive to open communication improves job satisfaction, an essential factor that may improve teacher retention.

Researchers argue that productive technology integration is possible when the leadership body provides resources relevant to the teachers' needs through PD opportunities among best practices (Postholm, 2018). Once again, the PD is most productive when it encourages collaboration among colleagues and allow the leadership body to identify desired outcomes (McComb & Eather, 2017; Powell & Bodur, 2019; Williams, 2017). Teachers' perceptions of the PD provided by the administrators can motivate and engage teachers in a more focused manner (Liao et al., 2017). Furthermore, collaboration among the stakeholders will improve the teachers' perceptions about the leadership body and possibly improve teacher retention (Player et al., 2017; Powell & Bodur, 2019; Torres, 2016).

Garcia and Abrego (2014) shared about the principals' influence in integrating technology to transform the learning process. Studies have shown that principals need to have a solid foundation with technology to properly support and influence their teachers (Powell & Bodur, 2019). However, many administrators do not receive proper training and are not ready for their technology leadership role: "Principals believed that technology had a positive effect and is an integral part of a successful education" (Garcia & Abrego, 2014, p. 15). Wang et al. (2014) described people born into the use of technology as *natives*. The authors shared that natives tend to be technologically literate, fluent, and comfortable with technology.

On the other hand, if the person started to use technology later on in life, technology adoption is a slower process. Song and Choi (2017) argued that when a more collaborative approach is implemented during the technology integration process, it may improve the learning community's rate of adoption. Principals' preparation is crucial before the technology integration process is introduced to the learning community. This will allow a smoother and more productive transition. The leadership body should have solid preparation to share their knowledge of technology; this will allow the administration to ensure the technology is being used in the classroom appropriately (Garcia & Abrego, 2014).

Another vital strategy for school administrators to be supportive is to foster innovative learning opportunities. Collaboration among the leadership body and their teachers should be sought after to ensure that technology integration is done productively (Swanson et al., 2018). Technology coordinators or technology leaders are also crucial for the incorporation of a plan that will be periodically revised and provide training and support to the teachers (Masullo, 2017). Additionally, the leadership body can develop a technology coordinator position or assign opinion leaders that are in-house teachers that are trustworthy and are ready to support others (Masullo, 2017).

Zhong (2017) agreed that it is essential for principals and educators to collaborate to incorporate technology in the classroom and improve student performance effectively. Raman and Shariff (2017) shared that principals are responsible for supporting teachers by providing PD and promoting digital citizenship through effective communication. Communication helps reduce misunderstanding and improves teachers' response toward the desired outcome (Masullo, 2017). Administrators following leadership practices that allow teachers to feel that they can communicate openly improve the technology integration process and have a more successful outcome. Whether the teachers are seen as change agents or feel that administrators value their

opinions, this type of relationship positively influences teachers' use of technology in the classroom. Therefore, 21st-century leaders should become well-versed with the facilitation of effective technology incorporation.

Technostress. Information technology (IT) integration in schools continues to grow (Georgiou, 2019). The learning environment has changed rapidly due to the rapid innovation integration that has led to more meticulous and creative planning for instructional delivery (Thannimalai & Raman, 2018). Technology integration has placed a demand on teachers to improve the selection of instructional strategies because they now need to plan to deliver their lessons using technology (Georgiou, 2019). This phenomenon, known as technostress, has recently been getting researchers' attention (Herculano, 2018; Özgür 2020). Herculano et al. (2018) studied the effects of technostress on teachers extensively in terms of its causes and adverse effects. However, Paulus et al. (2020) noted that there is not much research about the factors that may alleviate teachers' technostress.

Information and communication technologies (ICTs) have become a vital part of life and the teaching profession. The changes adopted by the educational system have made it necessary for teachers to continue to improve their knowledge and level of competence for them to effectively integrate ICTs into their teaching practice. As a result of developing more purposeful and effective use of current technologies, some teachers have experienced technostress (Özgür 2020). Özgür (2020) shared that this concept is a disorder resulting from a person's inability to use computer technologies effectively. Similarly, technostress produces negative feelings in an individual caused by ICT technology (Özgür 2020). Some teachers may be feeling inefficient, have continuous mental fatigue, and experience anxiety that may negatively influence their job satisfaction (Özgür 2020).

Leadership Body's Ability to Reduce Technostress. Positive interactions among teachers and the school administration, alongside support provided by colleagues, can alleviate technostress (Herculano et al., 2018). Reducing technostress caused by technology integration is possible through cooperation and understanding between the leadership body and the teachers (Amnat et al., 2019). Additionally, studies show that teachers' competency in using technology is also an essential factor in the reduction of technostress (Soleman & Danaiaata, 2018). Özgür (2020) ensured that teachers who are inadequate using technology, especially in incorporating technology for educational purposes, can gain experience and reduce technostress. Becoming more comfortable with technology usage in the classroom is possible through appropriate PD opportunities that improve their knowledge and abilities to adopt ICTs (Raman & Shariff, 2017). Furthermore, in-house training can be organized to facilitate teachers' integration of technology into their teaching repertoire.

Teacher Attrition. The problem of teacher attrition has been affecting the learning community for decades (Harfitt, 2015). Despite efforts of creating programs to prepare teachers to occupy those vacancies, many of these teachers leave the profession early (Donitsa-Schmidt & Zuzovsky, 2016). Contemporary researchers have explored teacher attrition from the perspective of teacher dissatisfaction due to stress and burnout (Janik & Rothmann, 2015; Rumschlag, 2017). Some argue that teachers who are content with the working environment are more likely to remain in their school (Janik & Rothmann, 2015). A way to improve the working environment is through open communication.

The teaching profession has high attrition rates. Despite having to meet rigorous requirements to enter the profession, many teachers change careers within their first year (Janik & Rothman, 2015). Teacher attrition is also a problem because it reduces the number of experienced teachers available to mentor novice teachers in the induction process and these

programs tend to be very costly (Harfitt, 2015). Moreover, since the U.S. Department of Education invests in these induction programs to hire teachers, attrition rates produce unnecessary costs nationally and in schools. It is also common for school administrators to hire unqualified teachers to alleviate the shortage and this can produce other problems (Rumschlag, 2017).

Technology is one way that the U.S. Department of Education, alongside its administrators, has been improving the teacher's working environment. However, teacher attrition continues to be a problem even in schools where technology is being incorporated. Contemporary researchers also theorize that teacher burnout is one of the most influential factors contributing to teacher attrition (Rumschlag, 2017; Vongkulluksn et al., 2018). Studies show that administrators who do not intentionally address burnout have lower test scores, show poor rapport with their teachers and students, and show greater absenteeism rates among the stakeholders (Donitsa-Schmidt & Zuzovsky, 2016). Contemporary researchers are encouraging more research about factors that influence teacher retention (Vongkulluksnet al., 2018). Although administrators have been working toward technology integration in the classroom to improve instructional delivery, a question to consider would be the following: Does technology integration alleviate or increase these stress factors? Player et al. (2017) reported that schools with teachers who experience high levels of trust and teachers who can communicate openly with principals have lower attrition rates.

Theoretical Framework Discussion

For this study, I explored teachers' perceptions of PD that could improve the technology integration process. I also sought to identify the type of stress associated with technology integration. Finally, through this qualitative descriptive study I explored PD initiatives that may reduce stress factors associated with the technology adoption process (Wambugu, 2018).

Technology integration among the learning community should be a collaborative effort with the leadership body. Forcing technology adoption without appropriate PD may increase stress factors that can work against teacher retention. Through this research study, I will be looking at PD from Vygotsky's social constructivist theory that encourages knowledge to be co-constructed and where individuals learn from one another (Vygotsky et al., 1978). I attempted to identify teachers' attitudes and beliefs regarding technology integration, looked at prior knowledge and personal experiences and motivation, and identified factors that may be interrelated with teachers' learning process (Vygotsky et al., 1978). Additionally, Bandura's social learning theory allowed me to determine, through the premise found in self-efficacy, a person's belief that they can complete a task successfully, and to identify stress associated with technology integration (Paulus et al., 2020). This theoretical perspective is supported by the principle of self-efficacy—a person's motivation to learn how productively they perform a task.

This qualitative descriptive study's central focus on teachers' perceptions of PD that could improve the technology integration process is highlighted through the need for continuous, interactive, and hands-on learning to construct a long-lasting understanding (Zhang et al., 2021). Also, I intend to determine how these PD opportunities help reduce stress factors associated with technology integration by looking at Bandura's social learning theory on the importance of the self-efficacy premise that influences a person's belief that they can complete a task using skills they currently possess (Rumschlag, 2017).

Constructivism

According to Zhang et al. (2021), constructivist theory focuses on student-centered learning classrooms. According to this theory, knowledge comes when the learners are given opportunities to question personally preconceived ideas to enhance their learning process. Students learn more productively when they are active learners and construct knowledge for

themselves (Zhang et al., 2021). Key constructivist theorists emphasize that the learning process is an active process in which one is to continue to build upon what a person has already been taught (Vygotsky et al., 1978). The basis of constructivism is that the learning process should be developed through prior knowledge and personal interactions (Georgiou, 2019). Therefore, providing PD that is designed to help the teachers, as students, construct meaning through what they already know helps improve the effectiveness of PD for personal growth (Georgiou, 2019).

Professional Development as Related to Constructivism

As we focus on the teacher as the learner, PD serves as the means by which teachers are exposed to this interactive learning opportunity (Mohammed & Kinyo, 2020). PD that follows a constructivist theory develops teachers' opportunities to engage in collaboration and share their knowledge. The constructivist theory in PD for technology integration motivates teachers to be actively involved in learning and applying knowledge. Additionally, teachers are to be supported through ongoing coaching and intensive modeling that involves problem-solving and hands-on practice (Paulus et al., 2020). PD for teachers, according to this type of theory, needs to build on instructional methodologies that incorporate both current teaching strategies and new ideas corresponding to technology integration (Paulus et al., 2020). Another critical component is to have follow-ups to identify the strategies that work and those that do not (Schrader, 2015).

Song and Choi (2017) emphasized that PD for technology integration should be active, applicable, and, most importantly, continuous. Sawyer (2014) spoke about Piaget's theory of how new ideas always emerge from old ones. One way to look into knowledge acquisition is through a continuous process focused on the person's development rather than as an end state (Schrader, 2015). A continuous approach allows teachers to grow throughout the technology integration process. Technology in the classroom should improve how teachers develop their lessons—the teacher is only the facilitator and can provide instruction in smaller groups (Wood

et al., 2018). Teachers may change to a more constructivist approach in their classrooms by using computers consistently and learning how to use them meaningfully (Paulus et al., 2020; Schrader, 2015).

PD plays a critical part in developing new skills (Luo & Hostetler, 2020). For PD to be more effective, principals also need to understand and apply the constructivist theory. Teachers are encouraged to practice the new concepts, while the leadership body is encouraged to provide ongoing training on how to effectively integrate technology into their classrooms and not provide one-day training without additional support or follow-up (Xu et al., 2017). A way to increase the teachers' understanding and desire to learn is through ongoing training that may improve personal attitudes and beliefs to apply the new skill into their daily teaching.

When considering teachers' confidence level, it is argued that using technology in the classroom can be intimidating without PD (Wood et al., 2018). PD for technology integration should follow a simple sequence of learning and application. According to the constructivist theory, effective learning through PD should be conducted in a more structured, ongoing, interactive manner. On a similar note, a social learning theory would ask for PD to provide modeling, has teacher collaboration, is ongoing, and keeps current with any technological advancement to improve teachers' skills and attitudes toward technology integration (Sariyildiz, 2017).

Ultimately, when PD follows the theoretical framework of social learning, teachers can possibly change their attitudes and beliefs about the implementation of technology in their classrooms (Paulus et al., 2020). These new attitudes and beliefs can, in turn, influence how teachers use technology in instruction. PD following a social learning approach may provide a supportive environment for teachers and allow them the opportunity to develop beliefs, reflect on their learning, and discuss interactions with the technology (Paulus et al., 2020).

Social Learning Theory

When looking into Bandura's social learning theory constructs, self-efficacy influences how effectively a person believes they will complete a task with what they already know. This theoretical perspective influences the person's motivation to learn, how well people learn, and their performance. The proposition is that people are more likely to become engaged in an activity if they believe they will complete it successfully (Bandura, 1971). Schrader (2015) affirms that schools should plan effective ways for increasing teachers' self-efficacy for technology integration in their classrooms. Teachers' lack of self-efficacy with technology could also cause a lack of confidence for them to integrate technology in the classroom. Another notable factor that increases self-efficacy is teachers seeing technology as an essential instructional tool (Barton & Dexter, 2020).

As technology has become such an essential part of the 21st-century classroom it is only appropriate to identify ways to ensure teachers are ready and are confident enough to integrate technology into their teaching repertoire. Therefore, both constructivist theory and social learning theory are a valuable framework for this qualitative descriptive study to explore teachers' perceptions of PD that could improve technology integration. The elements of these two theories are connected to this study's research design and provide a framework that expands through research questions. This conceptual framework applies the constructivist theory and the social learning theory to teachers' perceptions of PD for technology integration.

COVID-19 Pandemic

Global unforeseen adversities have resulted from the coronavirus pandemic. The COVID-19 outbreak struck nations worldwide. School districts in the United States moved to provide remote learning for their students because students were required to stay at home. However, developments earlier on in the pandemic included many educational systems that had already

started to adopt technology in the classrooms to prepare students for the future and meet the needs of today's and future workforce. DeVaney et al. (2020) shared that "online learning has skyrocketed" (p. 2), in light of the pandemic. DeVaney et al. also shared that if not for technology, academic continuity would be a struggle. Some New York schools already had the infrastructure in place for online learning to flow seamlessly. However, Griffiths (2020) supports continued advances in technology integration, especially when remote learning is the only possible way to teach and learn from a distance.

Gap

Classrooms in the 21st century have been adopting technology as a valuable resource for instruction delivery. There has been an increase in research studies about factors affecting technology integration in the classroom. Factors that may affect technology integration can be poor teacher buy-in, inadequate PD opportunities, and stress factors associated with insufficient preparation (Koster, 2017). However, further study is necessary to identify stress factors associated with the diffusion of technology and the impact technology integration has on teacher attrition rates. Powell and Bodur (2019) called for more research on teachers' perception of PD. Powell and Bodur also shared that although research has found that technologies support the learning community, few studies have investigated how the quantity and quality of PD improves technology integration in the classroom. Furthermore, more research is needed to show how effective communication and collaboration among the stakeholders helps to successfully implement the technology and reduce stress factors associated with the process (Powell & Bodur, 2019).

Summary

Teachers are now encouraged to use technology in the classroom as a resource to enhance the learning process. Many teachers, however, have not received appropriate preparation to

integrate technology into their classrooms. Programs designed to prepare teachers for technology integration benefit the learning community. PD opportunities can support teachers, so they feel confident and ready to improve their instructional delivery, and possibly be more productive through technology integration. Identifying factors that influence teachers' perceptions may also improve the leadership body's influence on teachers' technology adoption. The importance of teacher support systems comes from the implication that they can learn from each other. Presenting this type of study to administrators would help provide an understanding of the required technology and the needed PD for teachers. Teachers would improve their perception of technology in the classroom, possibly reduce stress factors associated with the technology integration, reduce teacher attrition, and improve the learning process. The following chapter explains the methodology I used to complete my research study.

Chapter 3: Research Method

In this chapter, I provide a rationale for selecting a qualitative descriptive study approach to explore teachers' perceptions of PD that could improve technology integration. I outline the research problem once more and restate the research questions used to guide this study. Additionally, I continue with a justification and description of the chosen research methodology and design for this study. In this chapter, I describe the population and reason for the sample selection used in the study, followed by a description of the data sources. The chapter ends with an account of the data collection process, data analysis procedures, ethical considerations, and the limitations of the research.

The purpose of this qualitative descriptive study was to explore teachers' perceptions of PD that could improve the technology integration process. Additionally, I wanted to identify stress factors associated with technology adoption and how PD may help to reduce stress factors associated with technology integration in one middle school in New York. High levels of teacher stress have adverse effects on teachers' emotional well-being (Saeki et al., 2018). The elevation of teacher stress may lead to mental health issues, impact teacher emotional well-being, increase teacher burnout and promote higher attrition rates (Gonzalez et al., 2016; Katz et al., 2018; Ryan et al., 2017).

To provide an overview of this chapter, I will share the reason I have chosen a qualitative descriptive study design as the most appropriate method for my research study. A description of the steps that I took throughout the research process to collect and analyze the data is also elaborated on. I also address possible assumptions, delimitations, limitations of the study and a description of how trustworthiness and ethical assurances was developed throughout the research study. To explore teachers' perceptions of PD that could improve the technology integration process, I collected data to answer the following questions:

Research Questions

RQ1: What type of professional development influences middle-school teachers' perceptions of technology integration?

RQ2: Which stress factors are associated with technology integration in the classroom?

RQ3: How can professional development reduce the stress associated with technology adoption for middle-school teachers?

Research Design and Method

I chose a qualitative descriptive study design to conduct this research study to explore teachers' perceptions of PD that may improve technology integration and identify stress factors associated with the process. Bradshaw et al. (2017) shared that this methodology is applied when the data is to be collected from the individuals undergoing a phenomenon. A qualitative descriptive study design allowed an overall view of the PD in one middle school, rather than simply examining how the teachers made use of technology in the classroom. Additionally, a qualitative descriptive design helped explore teachers' perceptions of PD opportunities that could possibly improve the technology integration process, and technology integration has recently become a focus for schools nationwide and worldwide (Wood et al., 2018). This qualitative descriptive study focused on a contemporary topic of personal and educational practitioner interest.

Population

The school chosen for this qualitative descriptive study was a low-income middle school in New York, that has integrated technology in the school at a 1:1 ratio with a large number of students who receive free or reduced lunch. I chose the participants using a combination of purposeful and snowball sampling. Identifying and selecting stakeholders that were knowledgeable or experienced with the phenomenon of interest helped improve the data

collected to ensure the validity of the study (Woodley & Lockard, 2016). I started with the administrator in charge of PD at the middle school and requested that he identify and select teachers that were experienced with technology integration in the classroom. Additionally, through snowball sampling, the selected participants were asked to recommend other teachers to participate in the study.

Study Sample

Ten participants formed the sample for this research study. Participants included in this study were from two groups. The first were teachers currently working at the middle school in New York. The others were teachers that left after the technology integration process started. To recruit the participants through snowball sampling, I contacted them via phone calls and then followed-up with an email to explain the study's purpose. I was able to obtain a mix of both male and female participants. The importance of the study was presented to the teachers about identifying possible ways to improve the technology adoption process and reduce stress factors associated with technology integration through the interview protocol (Table A1).

Materials/Instruments

I used two instruments for this research study's data collection. One was an interview protocol utilizing semistructured open-ended questions (Table A1). The interview protocol was created with the support of an expert panel to ensure the questions produced data that would effectively answer the research questions. The other instrument was myself, the researcher, as a tool used to collect, measure, and analyze the data collected for my research of interest (Yoon & Uliassi, 2022). My role as the researcher was not to simply collect the data ensuring that I provided a voice for teachers' perceptions, but to interrogate the data and provide an informed data analysis.

Data Collection and Analysis Procedures

Scholars agree that it is crucial to create a conversational space between the researcher and those participating in the research study (Yin, 2018). As a teacher that has gone through the technology integration process, I was able to establish rapport with those participating and wanted to create a feeling of interpersonal connection so that I could develop a partnership through empathy, transparency, and an unconditional positive level of understanding (Yin, 2018). I also worked on developing an unbiased interpretation of the data collected, explaining the coding process, and showing the development of categories and themes that emerged from the data analysis to refine myself as a research instrument while developing my interpretation (Wa-Mbaleka, 2020).

Data Collection

I completed the main data collection through interviews, which typically ranged in length from 20 minutes to about one hour. I conducted the interview sessions remotely through a Zoom conference (due to the COVID-19 pandemic) in a private area that participants chose so that they could express themselves freely. The interviews were conducted using the interview protocol developed through the support of the expert panel (Table A2). The interview protocol consisted of semistructured open-ended interview questions developed to facilitate discussions pertaining to the participants' perceptions of technology integration, the stressors associated with the technology integration process, and how PD can reduce these techno-stressors.

Creswell (2013) shared that qualitative research should be flexible and “cannot be tightly prescribed” (p. 186). Additional information was elicited during the interviews for more in-depth explanations. Semistructured interviews are an instrument that allows greater liberty when examining the research questions. Having a flexible design was essential when adopting this

qualitative descriptive study approach (Yin, 2018). Through this flexible design, the data collection process allowed me to document and consider distinctions found among the interviews. Having flexibility within the questioning was essential as I was able to take into account the differences between the teachers' perceptions while examining the same question. Simultaneously, it was essential for there to be some structure to the interviews and this created a method to compare the various interviews completed.

Data Analysis

The data analysis consisted of two phases, creating the interview transcriptions and applying a thematic analysis approach, commonly used for analyzing data collected through semistructured interviews (Creswell, 2013). Through thematic analysis I identified patterns of themes found in the interview data. Creating the interview transcriptions allowed me to identify themes and patterns of participants' accounts, characterizing particular perceptions and experiences relevant to the research questions (Saldaña & Omasta, 2021). The interview transcriptions were evaluated using Braun and Clarke's (2006) six-phase process for thematic analysis, outlined below.

1. Become familiar with the data.
2. Code words or phrases that give meaning to a data set.
3. Search for themes by looking for recurring words, ideas, and patterns from participants in a study.
4. Review themes to ensure sufficient data supports each theme.
5. Define and name themes to ensure each is distinct and given an appropriate name or phrase.
6. Produce the report of the data analysis through a logical account of data.

The transcriptions' interpretations were sent via email to participants for accuracy verification and to establish credibility with respondents' corroboration of specific findings (Yin, 2018). Leavy (2017) assures that the coding process helps reduce and classify the data collected. I incorporated in vivo coding. Creswell (2013) assured that the codes can represent the following:

- Information that researchers expect to find before the study.
- Surprising information that researchers did not expect to find.
- Information that is conceptually interesting or unusual to researchers and audiences.

Transcriptions went through several passes and were coded manually (Creswell, 2013). Finally, I summarized the data collected during this qualitative descriptive study and detailed the themes found through the data analysis. The themes serve as the foundation of Chapters 4 and 5. The generated interpretations allowed me to provide conclusions of the research study.

Validity and Reliability

Trustworthiness in every research study is essential to ensure the study's validity and accuracy. Appropriate use of the instruments and processes is also vital to ensure appropriate methodological considerations and rigor are used throughout the data collection and analysis (Bostancioglu, 2018; Song & Choi, 2017). To ensure credibility I provided a detailed description of the data collected and analyzed the data continually comparing to see if new ideas and themes arose or if the same notions reemerged. Credibility in data means that the findings are a truthful representation of the participants' views or experiences (Yin, 2018). One way to ensure credibility is by reducing the possibility of a bias selection of participants through snowball sampling selection (Woodley & Lockard, 2016). Another way qualitative studies show credibility is when your assertions are recognized by other researchers who have shared similar experiences (Yin, 2018). There was consistent checking of transcripts that included member

checking. To create the opportunity for transferability I provided detailed interpretations of the study's findings and results so that the study's findings could be applied to a broader population (Yin, 2018). Merriam (2018) shared that "one of the clearest ways to identify your theoretical framework is to attend to the literature you are reading that is related to your topic of interest" (p. 67).

Credibility. Credibility is developed through the knowledge gained by reviewing literature and personal experiences in various educational settings (Dikko, 2016). Triangulation in this qualitative study came from the data collected through the different interviews, my personal observations, and documents from the literature review, because the interviews were the main source of data collection. Cope (2014) shared that triangulation is one method researchers use to analyze data and improve the validity and reliability of qualitative research. Data triangulation between interviews is essential to compare results that are pertinent to the question at hand. Having data triangulation during a qualitative descriptive research study was essential because using a single data source could have possibly produced errors in the findings due to lack of corroboration. However, having multiple data sources from the different interviews increased the collected data's strength and reliability (Kern, 2016). The multiple sources assisted in developing a whole picture of the teachers' perceptions on the PD that may impact the stress factors associated with the technology integration process to compensate for limitations that could have risen from using a qualitative descriptive study method (Carter et al, 2014).

Dependability. To ensure dependability, I performed an audit trail to document the processes and forms used to conduct the research study and methodically check for understanding and ensure correct interpretation of the information collected. Confirmability ensures the results' authenticity and objectivity through an honest report of my potential bias; therefore, I obtained validation from the participants to ensure my interpretations reflected their

experiences accurately. These protocols and methods of data analysis contributed to the validity and reliability of the study. Validity and reliability indicate the study's accuracy and consistency, or lack thereof (Leavy, 2017).

Reflexivity. Solidifying the study through my personal reflection and reflexivity helped shape my interpretations of the data collected. Saldaña and Omasta (2021) argued that reflection is a personal immersion in the data looking for meaning from the study as a whole. Saldaña and Omasta added that "reflexivity is individual reaction on one's relationships with the data, the participants, the nature of the study, and even with one's self as a researcher" (p. 50). I had to consider how my personal experience as a teacher who went through the technology integration process could shape the study's direction. My personal commentary provides an additional perspective and shows the impact and relevance of my own experiences to help establish trustworthiness.

Ethical Considerations

Ethical responsibility was considered to protect the teachers' anonymity while providing their perceptions. Before interviews began, the participants were provided with a consent form with a detailed description of the study's procedures, confidentiality, and privacy assertions. Consent forms used for the study were submitted to the Abilene Christian University's (ACU's) Institutional Review Board (IRB) and to the NYC Department of Education's (DOE's) IRB. The forms outlined the study's purpose, protocols I would follow to ensure confidentiality, research study benefits, and possible risks. Participants were also informed that they could withdraw at any time of the research study. The participants were assigned a number to protect their identity. I provided a brief overview of the study and addressed any questions or concerns the participants had (Guest et al., 2013; Yin, 2018).

To ensure this study maintained ethical assurance, participation was only voluntary, through informed consent, and I requested permission for all transcriptions of all information collected throughout the study. Permission to conduct this study was obtained through the NYC DOE's and ACU's IRBs (see Appendix B). Participants were interviewed through a Zoom conference. I ensured that I provided welcoming interactions. I told participants they could withdraw from their participation in the study at any time. I offered copies of transcripts and my interpretations of them for member checking and I made an additional contact for follow-up interviews if they desired. Full disclosure of the study's purpose and an overview of the study was played out regarding what would happen during the interview sessions, alongside procedures for confidentiality and anonymity. I securely stored the information collected electronically in a password secured laptop; I am the only one with access to the participants' information. All information will be deleted from the database three years after the study's completion. To provide ethical assurance I am the only person with access to the transcripts. Each transcript has been labeled with the number assigned to each participant.

Assumptions

Assumptions, limitations, and delimitations in every study must be considered. One assumption for this research study was that the participants' perceptions are representative of those working alongside them and apply to larger populations. Secondly, that the teachers' perceptions came from the PD opportunities or lack thereof that they had experienced at this one middle school. Additionally, another assumption was that the PD the teachers have received promoted the acceptance or rejection of the technology integration process. Despite these assumptions, limitations, and delimitations, by documenting the experiences and perceptions of the teachers in this one school I was able to provide other researchers and organizations valuable information about how PD may affect teachers' perception of the technology integration, identify

stress factors associated with the process, and explore how PD could reduce these technostressors.

Limitations

Because I only interviewed the teachers in one school and interviewed only 10 teachers, the results may be less generalizable to larger populations. Furthermore, participants may have not answered all the questions truthfully and openly due to genuine concerns about job vulnerability and possible repercussions if the school's leadership body would learn of unfavorable responses associated with this study. The focus on teachers' perceptions possibly limited the scope of the study, which could have possibly been applied to other departments or occupations within the learning community. Personal biases were also a possibility during any phase of the research. However, a thorough evaluation of the literature allowed me, as the researcher, to become more knowledgeable and identify possible conflicting viewpoints (Yin, 2018). The qualitative descriptive study methodology comes with some limitations already because it focuses on a limited number of participants within a specific context (Noor, 2008; Yin, 2018).

Delimitations

I placed further limitations on this study so that I could control some variables (Yin, 2018). First, I limited the study to one institution so that some consistency in course design and delivery might be present. I also only focused on teachers' perceptions of technology integration instead of other staff members to ensure I investigated technology integration in the classroom. Also, although it is a large institution, faculty training is standardized for teachers only. I also limited the participants to including teachers that worked at the school after the technology integration process was introduced.

Summary

To conclude, the purpose of this qualitative descriptive study was to explore teachers' perceptions of PD that could improve the technology integration process. Additionally, I wanted to identify stress factors associated with technology adoption and how PD helped to reduce stress factors associated with technology integration in one middle school in New York. A qualitative descriptive research approach was chosen because it allowed me to obtain a deeper understanding of the problem and was appropriate for extreme or unusual circumstances (Yin, 2018). The participants in this study were formed by current and former teachers of this one low-income middle school. Data collection was through virtual interviews using Zoom. I transcribed the data collected to identify themes and patterns of participants' accounts, characterizing particular perceptions and experiences relevant to the research questions.

I ensured the trustworthiness of the research through the use of protocols for gathering evidence to analyze the data with pattern matching and logic models (Yin, 2018). Education professionals will also be able to use the detailed description of the data analysis and build their connections to other research studies. To ensure ethical research practices were employed throughout the entire research study, IRB approval was secured before the data collection process. I informed participants of the research study's purpose when I invited them to participate and asked them to sign the consent form. Participants were protected by using numbers to identify personal data, and personal data was securely stored. The interview transcripts were stored locked by personal password protection in a computer or drive and will be deleted from the computer's hard drive three years following the study's completion.

Chapter 4: Results

The problem of teacher attrition is found throughout the United States (Saeki et al., 2018). Today's teachers are confronted with additional stress factors associated with the need to implement technology in their classrooms (Mitchell et al., 2017). Despite efforts to support teachers' use of technology in the classroom, other concerns have developed (Zhang et al., 2021). The purpose of this qualitative descriptive study was to explore teachers' perceptions of PD that could improve the technology integration process. Additionally, I wanted to identify stress factors associated with technology adoption and how PD may help to reduce stress factors associated with technology integration in one middle school New York. This type of methodology allowed me to get an overall view of the PD opportunities that possibly improve the technology integration process in this one middle school. Technology integration has become a worldwide focus for schools, especially after remote learning was necessary to continue with instruction due to the COVID-19 pandemic (Wood et al., 2018). Participants' perceptions captured through semistructured interviews allowed me to understand these teachers' ability and level of comfort with incorporating technology into their teaching practices. The semistructured interviews were the main instrument used for this descriptive qualitative research. According to Korstjens and Moser (2018), semistructured interviews are considered appropriate methods for data collection for this type of qualitative descriptive research study.

This chapter includes an overview of the research questions, findings, and the teachers' perceptions. I conducted 10 semistructured interviews virtually in a Zoom setting. The participants were 10 teachers that are currently teaching or had taught at the school where the research study was conducted in New York. I removed all the identifiers from the data collected through the interviews to ensure ethical research practices were adhered to throughout the research study. The interview transcripts were stored protected by a password. I personally

transcribed the semistructured interviews and member-checked them with participants to ensure I captured the participants' perceptions and to reduce experimenter bias. I also found it appropriate to use in vivo codes with direct quotes for the data analysis. For example, the code *PROVIDING HANDS-ON PDs* was a response that many participants gave as important for them to be engaged in any PD opportunity.

Through Braun and Clarke's six-phase process for thematic analysis (2006), I refined those codes to generate specific themes that allowed me to construct meaning for the research questions and problem of practice. The five themes with their descriptions, codes, and names are organized in tables. The steps taken throughout the data analysis process were enumerated in the audit trail to ensure that the data collected was recorded correctly and that its interpretation was an accurate representation of the data. To finalize, I used the selections from extracts that related to the literature to produce the data analysis and recommendations from the participants' perceptions.

The findings of this descriptive qualitative study are a representation of the middle-school teachers' perceptions of PD that may improve technology integration and identify stress factors associated with the process. I solicited participants by email using a non-probability snowball sampling method in which participants could recommend another person as a possible participant. The objective was to conduct semistructured interviews to obtain perceptions about PD and stress factors associated with the technology integration process. The data collection started by recruiting the administrator in charge of PD at the middle school. This participant was asked to also suggest other potential participants. Once the participants agreed to volunteer in the research study, I sent another email with an explanation of the study and a consent form. After I conducted each interview, I asked all the participants to recommend other possible participants for the research study. I would then assign numbers to ensure anonymity of the participants for

the semistructured interview transcriptions. There were 10 voluntary participants. All participants were full-time teachers who currently taught or had previously taught at one middle school in New York. All 10 teachers integrated technology in their classroom instruction. Some demographic information about those who participated in the research study are found in Table 1.

Table 1

Demographics

Interviewee	Years teaching	Gender	Currently working at the middle school
P1	12	M	YES
P2	1	F	YES
P3	2	F	YES
P4	12	M	YES
P5	8	F	YES
P6	1	F	YES
P7	10	F	YES
P8	15	F	NO
P9	8	F	NO
P10	13	F	YES

Three research questions guided data collection for this study. The results were analyzed using Braun and Clarke's six-phase process for thematic analysis (2006). Through the thematic analysis I identified and interpreted theme from the data set produced from the semi structured interviews. For the coding process, I read and did several passes taking into equal consideration all the transcripts. The in vivo codes were generated from the participants' responses and perceptions where patterns from collating the information developed the themes identified (Dong et al., 2020). These codes were further collapsed into five themes: two were associated with the first research question, two other themes were associated to the second research question, and the fifth theme was associated with the third research question shown in the tables that follow.

Additionally, relevant extracts for each theme were collated and presented. The themes were also compared against each other and the original research questions.

Research Questions

RQ1: What type of professional development influences middle-school teachers' perceptions of technology integration?

RQ2: Which stress factors are associated with technology integration in the classroom?

RQ3: How can professional development reduce the stress associated with technology adoption for middle-school teachers?

Themes Developed From RQ1

What type of PD influences middle school teachers' perceptions of technology integration? There were two themes developed from the data analysis. These two themes are described below.

Theme 1: Professional Development Should Be Hands-On, Continuous, and Targeted

Table 2 presents the first theme and the codes associated with the categories that developed from Theme 1.

Table 2*Theme 1: Hands-On, Continuous, and Targeted*

Theme 1	Codes
Professional development should be hands-on, continuous, and targeted to improve teachers' perception of technology integration in the classroom.	<ul style="list-style-type: none"> • "It's important to give a hands-on experience to teachers." • "Theoretical and practice the application." • "Teachers could see the relevance of what is being shared with them." • "It is important for teachers to facilitate it." • "Who better to really share their practices?" • "Sharing their practices and experiences." • "Has to be purposeful for the participant." • "If it's something new for them, it's a more engaging experience." • "PD once a week for an hour allows teachers to see other teachers' practices with technology in the classroom." • "You see something hands-on yourself while being the student in professional development, it actually helps." • "The training in action is actually the best to be able to learn." • "Having people available to be able to answer questions and be willing to help." • "To have student-led discussions I would like opportunities where technology can help facilitate that." • "Allow teachers to give more input into professional development." • "If I am doing it myself and it is interactive, then you know that is going to keep me super engaged." • "I would like professional development to be as targeted as possible." • "Doing teacher surveys on what teachers may need to improve their craft." • "It has to be targeted, and I think that is the key to being productive." • "You have to have a goal or target in mind."

The categories that developed after analyzing the codes found in Table 2, included in this theme, concerned PD opportunities that are hands-on, continuous, and targeted. Participant #2 (P2) spoke about that the type of PD they would like to see, saying, “I would like professional development to be as targeted as possible.” Theme 1 encapsulates teachers’ perceptions of the type of PD they felt is worthwhile for their learning process and how PD opportunities contributed to personal comfort levels for technology integration in their classrooms.

Hands-On. PD that is hands-on allows a higher level of engagement for the teachers. A hands-on approach allows active learning for teachers to engage with technology integration into their classrooms. Teachers are also active learners that need to grow in order to meet the needs of a student population that is ever-changing with resources and practices that are also ever-changing. Four participants addressed the relevance of teachers as learners to experience growth. In the interview P4 captured hands-on learning best:

The way we have participated in it is that the teachers are the ones leading and facilitating professional development. What they are doing is the same thing that they are doing in the classroom as far as the task or the work that is being distributed to the students. As teachers are taking the role of the students, which gives us the opportunity to really engage with the work the same way the students would.

Adopting new teaching strategies supports growth. However, these new strategies need to be proven to be effective or not. One way that this middle school ensured the effectiveness of their resources and strategies was by providing every teacher at their school the opportunity in PD sessions to teach the whole group of teachers as they would present their lessons to their students. P9 explained the entire process as follows:

So basically, it starts off the way the structure is run in the regular classroom. We do like a preassessment in the beginning as soon as the professional development starts. It looks

a little bit different for ELA than it does for math. So, it is pretty much a task; it could be a reading assignment and then answering a question. Then, all the teachers would answer the question. Then we get to see everyone's responses and discuss them. Then we have the opportunity to redo the question again, and based on our answers to the question, then the facilitator would assign us a different task, which is really interventions, to help us with the skills that either we are lacking or if we show proficiency, it would be an intervention that would take us to the next level of mastery. We end with what is like an exit ticket, but it is really a mastery assessment that is done at the end of the session.

At this middle school in PD sessions, the teachers present the lessons with resources and intervention applications that address any misconceptions. P1 expressed the relevance of having teachers be the ones to present the PD sessions, saying that "I think it is important for teachers to facilitate it. They are the ones incorporating technology, and so who better to really share their practices?"

P8 shared their personal observations of how hands-on PD improved the teachers' level of engagement as follows:

So, even though I definitely generally needed what was being covered or reviewed, I didn't always engage fully with it because it depended on what the message was of the PD and how it was conducted. Did we just have to listen to lectures, or did we get to do hands-on work? Did we get enough time? Did we get all the materials needed? Did we get different perspectives?

P2 and P3 shared that the PD at this middle school was hands-on because the teachers are the only presenters. P2 commented, "We each take turns where teachers lead the professional development each teacher got a turn, so it was fair." P3 shared, "Each teacher shows what they

do in the classroom, the forms they complete, or the interventions they give the students based on their subject. So, they are basically teacher-led.”

Continuous. PD sessions at the one middle school have become continuous. Every week for the entire school year PD sessions took the same format. The purpose was to teach both new and veteran teachers a new protocol that would be followed by every teacher no matter the subject. P1 shared that “PD once a week for an hour allows for teachers to see all kinds of different practices with technology in the classroom.” The reasoning was directly focused on creating a level of comfort for every teacher to present to their students what they learned in PD. Also, it enabled every teacher to explore other teachers’ practices and see how they could work in their own classrooms. Most participants shared the same type of focus for PD for the current school year.

One of the more veteran teachers, P8, shared that in previous years they would have preferred continuous PD, because in the past there were sessions that happened only once. P8 spoke about their personal dislike of one-time PDs and the need to provide follow-up, saying what they would have liked to happen:

Coming back to check after I tried, to ask how it went. How did it go? What was difficult? Follow-up. It’s like they put you on skates and then leave you alone on the ice. First, you sink or swim, but then you just stop moving.

P8 also spoke of the importance of having more than one session available for a PD clearly stating personal feelings whenever there was a one-time session. This is how they felt:

Today you have three hours to learn this and then you have to go run with it. But a continuation . . . so let’s say . . . having a series of sessions supporting one type of idea or one technology piece that they wanted us to integrate, right? So, instead of just saying that’s it . . . one Monday, once a month . . . this is what we’re doing, and next Monday,

you are learning something new. I would have liked a continuation to develop how you're going to progress with one piece.

P10 shared about the importance of PD that is continuous:

Professional development currently consists of activities that would be geared toward developing a similar pedagogy practice for the school. They base the sessions on the same protocol. I think it becomes useful because everyone gets to see what the other teachers are using and what works for them, so that makes it more meaningful.

P3 spoke about the value of a continuous approach to PD stating, "So practice makes perfect." P3 also thought it was important to have support available after the PD sessions as part of the continuous approach. For example, P3 shared that they would like "having people available to be able to answer questions and be willing to help." Learning should be continuous and resources should be readily available for continued support.

Targeted. When PD is targeted to the persons' particular questions and interests it allows for a more engaging session. P9 spoke about how having targeted PD encouraged a higher level of engagement:

There have been some professional development that I have been very interested in and have been very engaged in from the beginning to the end and others that seem like they are kind of redundant, where I have not necessarily given it my all as far as engagement goes. I think the part that draws me the most is seeing when new tools are being introduced. Even in the math department, it was like extraordinary to see certain things that I could have used in my own practice, and I was fully engaged because it was something that was relevant to me. But sometimes, when it's the same or is redundant from one week to the next, having the same process, the same tools, where the only thing that is different is maybe a question, then I lose engagement.

P1 also shared the importance of targeted PD that considers teachers' personal years of experience and level of mastery:

I think overall, teachers between 0 to 3 years of experience are more engaged, so you know, it varies. I think it has to be purposeful for the participant, and that is where the engagement lies. If it is something that they know, are comfortable with, or have mastered it, maybe they won't be as engaged, but if it's something new for them, it's a more engaging experience.

Most of the participants shared their desire to explore new tools and applications. However, they were more interested in learning about specific tools labeled as standard, grade level, and/or subject area. P1 expressed the importance of dedicating PD time specifically for this purpose because these take time to explore in discussion:

There are new tools that come out every day for education, and it is hard for teachers to explore these resources without spending the time to explore these resources. If you don't have the time carved out for the teachers, their lives and professional lives are very busy, so it is important to dedicate time for professional engagement, to sit back and engage in something new.

P8 also expressed where the importance lies:

PD showing me the need for it and showing me why and how it has worked and then showing me how it can be used with our population because one size does not fit all and what works here doesn't necessarily work over there. Maybe it doesn't work for my students, so really, context is a key factor and how technology is presented as well as whether it is appropriate for our population.

P6 pointed out that PD can be more targeted by creating the opportunity for the teachers' voice to be heard:

I think if we dedicated more time to how we can use technology to better support our students, whether they are ELL students, whether they are SPED students, or even just how we can use technology to push our kids farther. What are some other things that we can use for our students who are doing extensions or have already mastered standards? What else can we use in order to support them as well?

Many of the participants expressed that they would appreciate the opportunity to share their thoughts about the PD sessions through surveys. P9 shared that the school's administration does provide the opportunity to express their feedback of the PD sessions:

I know that at the end of each professional development, there is a survey where the teachers get the opportunity to rate how valuable the professional development was to them and what they would like to learn more about. So that definitely happens. As far as the follow-through with it, I'm not quite certain about it.

P8 mentioned that in previous years not everyone had the opportunity to share what type of PD session they were interested in:

I guess it was another group of teachers really selecting what PDs we did, but that was not widespread. That was not the norm for us to be surveyed between these choices; which ones do you feel you need to learn the most about to improve your knowledge and instruction? At least the vast majority of teachers were not taken into consideration or surveyed.

The majority of the participants agreed that surveying the teachers was a good idea to have more targeted PD sessions that create a more engaging environment. P9 stated, "I always include the survey, and I pay close attention to it." P9 also shared having expressed to the administrators that "Hey, a lot of people are requesting this. Is this something that can be

incorporated in the future for them to address these needs?” P4 shared the following about targeted PD:

I think you have to give opportunities where teachers feel that they are constantly improving in a certain area because your weakness may not be my weakness. If it is a schoolwide initiative, then I get why it is sustained, but I would like professional development to be as targeted as possible, and you know, one way of doing that is by doing teacher surveys on what teachers may need to improve their craft.

The majority of the teachers that were interviewed agreed that it should be a priority to provide targeted PD sessions. Also, there is the need to identify the teachers needs and how those needs can be addressed. P10 stated the following:

I just think that just moving forward, they should incorporate more priorities so that we could all keep up-to-date with what is being added to the educator’s toolbox and just so that we can also make it more aligned towards specific content, like I said. You know, everything continues to change, and that way, the professional development would be more aligned.

P7 shared that before the PD begins the presenter should always assess for what is already known and know what they should bring out of their toolbox:

I know that as teachers we should never assume that the student knows everything . . . so you have to know your audience. So that you know more or less what tools to come out with. It’s about catering to your audience. If there is a DJ and they see it’s an older they might just want to listen to the music low or maybe they may want to listen to something with a slow tempo. If it is a young crowd, the DJ may want to play something that is up-tempo, that is going to make them want to dance. So, it is the same thing with

professional development, we have to feel out the audience. We are the audience and we need to buy into it, because if we buy into it, the kids believe.

Theme 2: Teacher Buy-In Improves Through Professional Development

To improve teacher buy-in for technology integration in the classroom the PD needs to be geared toward understanding the importance of technology and how technology-infused lessons support instruction and learning. Table 3 presents Theme 2 and the codes for this category.

Table 3

Theme 2: Professional Development That Improves Teacher Buy-In

Theme 2	Codes
Teacher buy-in improves through professional development geared towards understanding the importance of technology and how technology infused lessons support instruction.	<ul style="list-style-type: none"> • “During the Pandemic, teachers were thrust to use technology.” • “New tools that come out every day for education.” • “Hard for teachers to explore these resources without spending the time.” • “so it is important to dedicate time for professional engagement.” • “Sit back and engage in something new.” • “that’s our responsibility when we bring our teachers onboard.” • “Professional lives are very busy.” • “preparing our students for the world that they are going to step into as an adult and as a professional.” • “Technology is not going anywhere.” • “Technology is there to make teaching and learning more efficient.” • “technology has been created to make our lives more efficient.” • “Technology is there to make teaching and learning more efficient.” • “You are not taking home 90 papers to grade.” • “Teachers must believe in it and understand its value of it.” • “It is super important for teachers to understand how it benefits them and their students in the classroom.” • “Teachers need to understand the vision behind it.” • “I get quick data points on how my students are doing.” • “had a stack or a bunch of papers, I had to go through them one by one.”

Professional Development That Provides Understanding of the Importance of Technology. Teacher buy-in comes when they understand the why and the importance of what is required for them to adopt. PD that allows the teachers to see the importance of technology allows for a faster adoption rate. P1 shared the following:

There are stages for the adoption of anything. I think teachers must believe in it and understand the value of it. Before they can adopt it or anything, it is super important for teachers to understand how it benefits them and their students in the classroom.

Teachers need to understand the vision behind it and why or how it impacts teaching and learning for the whole population. P1 explained that

They have to see a purpose and know the why behind it and why this matters, and how it is helpful. I think what is big for teachers and students is to understand that teaching and learning become more efficient. So, the turnaround time between the teacher giving a student information and sharing information with students and grading . . . you are not taking home 90 papers to grade. Now, you can read things from a laptop or phone sitting anywhere; and technology has been created to make our lives more efficient. Technology in any domain has a goal to make our lives more efficient. Education is no exception and teachers may need help understanding that technology is there to make teaching and learning more efficient.

Professional Development Targeted to Teach How Technology-Infused Lessons

Support Instruction. One of the many benefits of using technology in the classroom is that you are able to use many digital resources and applications to deliver instruction. P6 shared that “using technology in the classroom is actually good because you are able to use different programs. Knowing your students’ responses at the click of a button is also a good reason to use

technology in the classroom.” P4 shared, “I am able to aggregate the data and get the data quickly so that I can understand which students may need that support?”

P3 also shared the following:

Using technology in the classroom is the best because it makes it easier to get things done. Definitely easier because it cuts out . . . creating anchor charts. I love working here. And avoids those paper bulletin boards. We have digital bulletin boards, and they are so much better.

P1 shared one of the many benefits to technology-infused lessons, “Our teachers are the ones that suggested the digital bulletin boards. They said, ‘We are working digitally now; why would we be doing physical bulletin boards?’” More than half of the total participants shared the benefits of digital bulletin boards. P1 shared, “I think it alleviates a lot of stress. You can do your bulletin board from your bathtub on your laptop.” P3 shared that “it was extremely difficult for me to do bulletin boards back in elementary school when you had to do the cutouts and use paper borders, then you had to get all artsy with them.”

P7 shared their personal convictions about the benefits of using technology in the classroom:

Previously, I mentioned how active learning is necessary for teachers to grow as pedagogues. To be a 21st-century teacher, technology-infused lessons are necessary. I wanted to do more, so I wanted to learn more on my own and on my own time practice with these different digital applications. It did on many levels; it really did. You know like, if it wasn’t for Maria showing me the Virtual Field Trips and making my curriculum come alive with virtual field trips and using the 3D virtual reality glasses . . . that is awesome. Also, iCivics and teaching the Constitution and then having the students actually practice rulings of court cases or engaging in the Electoral College through

games are all things that the kids are not only watching but also learning how to use YouTube effectively and learning how to find videos that are short and engaging. Then taking YouTube videos and using them on the platform of Ed Puzzle where students can stop, jot, and engage with the content and even after that, read the actual document and then play a game. So, the combination of all those things just helps you understand a complex concept.

P10 expressed that technology supports the teacher so that they can do more in smaller amounts of time:

I would prefer to use technology in the classroom rather than say I won't because, again, being only one teacher for 30 students, it's like having a second pair of hands for you, so pretty much provides a lot of support for the students that you are not able to provide for every single student in the classroom at every single moment.

P6 shared that technology allows the teacher to provide resources that address misconceptions in a way that is personal, targeted, and differentiated, all in one lesson. P6 supported the idea that technology improves turnaround times for providing timely feedback and support systems for their students saying, "One thing that has helped me is being able to review data a lot faster." P6 shared the following:

We are able to use the forms and collect data really quickly as the students are completing the assignments. It helps me kind of gauge who is understanding. I download the data right away to look at their responses quickly to see who understands and who doesn't. This helps me with my groupings, and this is something that would be quite difficult if technology wasn't involved because you would have to go to each individual student to see, but here I have it all on my computer right in front of me, and the

professional development has helped me because I see how other teachers are doing it and I am seeing how they are grouping their students to address different misconceptions.

Themes Developed From RQ2

Which stress factors are associated with technology integration in the classroom? There were two more themes developed from the data analysis. Theme 3 and Theme 4 are described below.

Theme 3: Identified Stress Factors Associated With Technology Integration

The category developed through this theme was identified stress factors associated with technology integration in the classroom. Table 4 presents Theme 3 and the codes for this category.

Table 4*Theme 3: Stress Factors*

Theme 3	Codes
Identified Stress Factors	<ul style="list-style-type: none"> • “Integrating new technology that they have not had the time to become comfortable with. That puts them in an uncomfortable position.”
Associated With Technology	<ul style="list-style-type: none"> • “In front of 15 to 30 students.”
Integration	<ul style="list-style-type: none"> • “When you’re unsure, and you’re having to do this with your students, it is an uncomfortable position to be in.” • “We need to differentiate the PDs.” • “To be more proficient, we need input from teachers, and that is what guides that work.” • “The difficulty with our students that are newcomers and do not really know much about using technology.” • “They are pretty lost at times and that it is very time-consuming.” • “Sometimes I would get observed, and if the board was blank or maybe it froze, that was a bit of a problem.” • “Then there are still some students that prefer or like a physical book.” • “We don’t necessarily use the apps to their full potential.” • “Not give everything in one shot, it makes you feel like, you know what, I can’t do this.” • “Certain contents require a more kinesthetic approach to aid in muscle memory and retention.” • “Having to navigate new devices and jumping right into the content can be stressful.” • “New middle schoolers are not familiar with using Apple devices for educational purposes.” • “Initial hurdle of getting students acclimated with their device.” • “When the laptops don’t have any charge.” • “Have a handful of students idle waiting for their laptops to charge.” • “I don’t use paper or pens as a backup, so I had to improvise.” • “That coming back to check after I tried, to ask how it went. How did it go? What was difficult? Follow up. It’s like they put you on skates and then leave you alone on the ice. First, you sink or swim, but then you just stop moving.”

Identified Stress Factors Associated With Technology Integration in the Classroom.

Although technology integration in the classroom has the intention to create a more effective teaching and learning process, it comes with stress factors. All of the participants responded positively in regard to using technology to deliver instruction. P2 shared, “I am confident that I can deliver instruction and that the students can get the materials. I have no issue with preparing my materials online and preparing everything they need for that to occur.” P5 responded, “I prefer to use technology in the classroom. One, because it brings learning alive. Two, you can differentiate learning for different students.” Furthermore, P7 shared, “I learned from one of the professional development presenters that there are sites where you can schedule conferences with students and with teachers from other countries, and that is culturally responsive teaching right there.”

However, they also shared some of the stress associated with technology integration in the classroom. P2 pointed out the frustration of having newcomers that do not even speak the language and having to deliver instruction through the use of technology: “[There is] the difficulty with our students that are newcomers and do not really know much about using technology and they are pretty lost at times and that it is very time-consuming.” P4 shared, “I know that there is so much technology out there that sometimes it is overwhelming.” Two other participants spoke about the stress they encountered when the electronic devices ran out of power. P6 stated that “technology sometimes dies out. You know... the kids are like, “Miss, my computer is dead.” You already know. That is my biggest issue with that.”

P 9 shared the following about this issue:

When the laptops don't have any charge . . . Jajaja! That's it. I walk around like a bag lady with about 7 to 10 chargers at hand just in case someone's laptop is without battery power. Especially by the time they reach the 7th period. So, that makes me

uncomfortable because that would mean I would have a handful of students idle waiting for their laptops to charge, and I don't use paper or pens as a backup, so I had to improvise. But that makes me very uncomfortable.

Other stress factors are associated with the process of students learning how to use the technological devices. P3 expressed that "having to navigate new devices and jumping right into the content can be stressful." P2 also shared, "New middle schoolers are not familiar with using Apple devices for educational purposes." This middle school provided MacBooks for students and teachers. Those students that do not know how to use the devices require for there to be a period of instruction not only to learn the content but to explore the electronic device, which adds stress to the instructional process.

Theme 4: Impact of Resources on Stress Factors Associated With Technology Integration

The category developed through this theme was stress factors are reduced when there is an abundance of technology resources available. The fourth theme and the codes that developed this category are listed in Table 5.

Table 5*Theme 4: Impact of Resources*

Theme 4	Codes
Stress Factors Are Reduced When There is an Abundance of Technology Resources Available.	<ul style="list-style-type: none"> • “We have a very good... 1 GB internet connection.” • “We have content teams and grade teams.” • “It’s about finding what works best to meet the needs of specific students.” • “These are resources that come from our teachers and even our students.” • “We look to expand our toolbox of applications.” • “Teachers constantly share with us certain apps that they have encountered from other teachers.” • “See the kind of impact it has, and if it works, we like to expand it, you know to the whole population.” • “I feel good about it. I believe we should definitely have teachers give their input on what they want and what they need.” • “Teach me how to help the students instead of me having to figure it out.” • “I was raised in the generation that was born using technology, and it was available to us, so I am very comfortable with it.” • “Our teachers are the ones that suggested the digital bulletin boards.” • “Like we have laptops, we have microphones, we have all these types of different equipment that I feel like it’s perfect.” • “We have digital bulletin boards, smart boards, and a lot of different types of technology.” • “I am good with technology, and the technology here seems perfect to me.” • “I liked the most was when the teachers would demonstrate what they were doing in their classrooms.” • “Able to get the digital bulletin boards and learn how to do them, made it so much easier.” • “Being demonstrated new programs, how to use them oh, and how they would be useful.”

Stress Factors Are Reduced When There is an Abundance of Technology Resources

Available. Most of the participants spoke about how the abundance of resources improved the technology integration process. They shared that every tool necessary was provided. P2 spoke about those tools saying, “We have laptops, we have microphones, we have all these types of different equipment that I feel like it’s perfect. We have digital bulletin boards, smart boards, and a lot of different types of technology.”

This middle school had already adopted digital bulletin boards to replace the more traditional methods of displaying student work. They have digital boards to display presentations of the students’ learning process. Most of the participants spoke positively about the digital bulletin boards. P3 stated, “Definitely easier because it cuts out . . . creating anchor charts. I love working here. And avoids those paper bulletin boards. We have digital bulletin boards, and they are so much better.” Additionally, P3 said that

It was extremely difficult for me to do bulletin boards back in elementary school when you had to do the cutouts and use paper borders, then you had to get all artsy with them/ And that is not my forte . . . , so when I finally was able to get the digital bulletin boards and learn how to do them, it made it so much easier.

P1 also supported the idea of bulletin boards:

Our teachers are the ones that suggested the digital bulletin boards. They said, “We are working digitally now; why would we be doing physical bulletin boards?” I think it alleviates a lot of stress; you can do your bulletin board from your bathtub on your laptop. I see our math teachers creating great bulletin boards. I think it makes a lot of sense. I think it is the best way to showcase digital learning, so it alleviates the stress.

Most participants shared how technology in the classroom supported instruction. P5 shared, “Using technology in the classroom is actually good because you are able to use different

programs.” So most definitely, a good Internet connection was another resource that this middle school had a positive response to. All of the participants shared that they appreciated the speed and reliability of the internet connection and that maybe only once or twice in a school year there was a problem with the Internet. P4 stated, “If I had to rate it out of 10 and 10 being great, I would say it is pretty high; it’s a 9. So, the Internet is definitely reliable.” P1 confirmed that the middle school invested in the amount of Internet they provided, “We are fortunate in that regard we have a very good 1 GB internet connection. It works well to sustain online learning. So, definitely very fortunate in that regard.” P5 affirmed the level of Internet connection saying, “I have no problem with the Internet speed or connectivity in my classrooms.” P6 went into more detail and spoke about the previous school year:

I would say that the school is great as far as making sure that the Internet is always running, considering that we use it every single day and we rely on it every single day. I would say, maybe once or twice, I have experienced the Internet going down in one whole school year. I don’t know of any other years, but the school has been really great as far as making sure that everything is running the way that it is supposed to so that it does not disrupt the instructional flow.

Another type of resource available to the teachers was technical support. The majority of the participants expressed being content with the technology department and their response to technology issues. P10 shared, “The tech department does a good job. You can always reach out to them whenever you need help, and they do as much as they can to help you. So, I think that the level of support is good.” P6 commented, “There was one instance in one of my classes where it was not working, and they were able to get the technology person in quickly to come to get it fixed, so that was definitely helpful to get using the microphones to support us as well.”

Despite the majority of the participants sharing that they were satisfied with the level of technology support provided by the middle school, some of the participant shared concern about having only one person responsible for technical support. P8 expressed a level of frustration when a few years ago the only technology person left the position, and this caused a delay:

Well, at the beginning of the year, it was really better, but at the end, I think we didn't have technical . . . it was usually good, but it was not as consistent during my last year there. The IT person left, and there was kind of a transition period where we were in limbo.

P5 also commented on the dangers of having only one IT person in the technology department saying, "As someone who actively tries to implement new apps or websites, I would like to have one tech support individual per grade, especially at the beginning of the school year. One person per school creates a delay." Furthermore, P9 also shared concerns about only having one person available for technical support:

So, my support went very well, but I do believe that there needs to be a team. I believe that currently there is only one person providing that support, and you know they may get spread thin, despite how fast they may like to respond when there are different requests coming from different teachers.

Themes Developed From RQ3

How can PD reduce the stress associated with technology adoption for middle-school teachers? There was one theme developed from the data analysis for Q3. The theme of collaboration is the fifth and final theme and the teachers' comments are reported in Table 6.

Table 6*Theme 5: Collaboration*

Theme 5	Codes
Professional Development That is Collaborative Reduces Stress	<ul style="list-style-type: none"> • “Without teachers teaching teachers, nothing is possible” • “We have content teams and grade teams.” • “We each take turns where teachers lead the professional development” • “As a new teacher I could see how the other teachers use their forms and their resources” • “The apps that they use gave me ideas on how I can use an implement them in my classrooms.” • “Going over everybody’s input on any type of applications that we use and also let’s say” • “As a new teacher, I would like for other teachers to show each other,” • “Showing each other how to use the forms, how to create them, and help each other out in that respect” • “It helps me a lot because then I knew what to do and how to change it up. I was able to figure it out” • “Being able to have other teachers show what they do in their classroom” • “So many things that I didn’t know I was able to do” • “Surprised that I could also do that too” • “Being able to ask other teachers what they did” • “Having the opportunity to ask teachers questions right there was very helpful and very convenient” • “Giving feedback would keep the trainer engaged” • “Everyone is a team player and are willing to provide you with information.”

Theme 5: Collaborative Professional Development Reduces Stress

Participants pointed out that they learned about new apps and digital resources from PD, personal exploration, students, and their colleagues. The participants shared that they discovered apps that worked best for their personal teaching practices and when these worked for their instructional delivery, they shared those with others. P1 shared that

a lot of teachers this year were sharing their practice and experiences. We have actually seen positive results. We have teachers picking up the practices and approaches that they are seeing from what teachers are sharing in the PD sessions. I think that that was a high light of these PD sessions we have done. We are now seeing them implementing what they have learned in the PD sessions.

The majority of the participants expressed appreciation for the support of their coworkers. P4 and P9 were appreciative of having other teachers share the resources that they use in the classroom saying that there were “so many things that I didn’t know I was able to do” and “[I was] surprised that I could also do that too.” This worked to their advantage because this approach reduced the amount of time required to look for appropriate resources that were targeted to the learning standards or concepts that they wanted to incorporate in their classrooms. Additionally, they were able to see the value of those resources and were able to buy in to the use of these applications. They were excited to see how the other teachers were productively using these resources in their classrooms saying, “It helps me a lot because then I knew what to do and how to change it up. I was able to figure it out.”

P8 shared the following:

I was very blessed . . . thinking about everyone that I partnered with, it was generally, like 90% to 99% of them were really great, like helping me stay on top, understanding, sharing their comments and how to avoid any issues. I really liked that, and I really felt like my peers, and those working on my team were really supportive throughout the process.

P8 also shared being comfortable asking questions and that the other teachers were always willing to help and share resources they have found to be useful for delivering instruction.

P9 was open to sharing how seeing the other teachers incorporating the technology and resources into their classroom with the same student group encouraged them to adopt the technology. Especially technology that improved instructional delivery, claiming that collaboration made them feel more comfortable to explore more resources and applications. P9 acknowledged that collaboration among colleagues across different subjects or grades could also be beneficial:

It is great to see what is happening in the classrooms next door that otherwise you would not have the opportunity to see. Also, seeing how some of my same students are performing in other classes. Learn what kind of work they are doing and how they are being challenged by other content area teachers. You now, because we have interdisciplinary teams, but we have a limited amount of time in which we really sit and collaborate. So, this is a great opportunity to be able to be on the same page as well. Sometimes, we start conversations like, “Oh, so that’s what you do with them? Oh, so you are having them do that? I am going to have to step it up and make them do that as well,” and it just creates a community of learning, and it’s really amazing to see it happen.

Other perceptions regarding peer collaboration were that it does not only have to happen with peers in your school but worldwide. There may be opportunities where teachers from other schools, boroughs, cities, or even countries can share their resources and strategies for developing technology-infused instruction. PD provided through this one school in New York, encouraged positive perceptions of the possibility of learning from different teachers in other countries or regions. P7 shared their level of satisfaction in regard to peer collaboration:

I am extremely satisfied. Extremely satisfied. Especially learning from my peers and my colleagues because it’s like we are growing together. Also, not only did they provide

me with professional development in the house, but I have also been blessed to have the opportunity for them to send me to conferences such as the EASTEC, and it is to see that this is just not a New York or just one school in this is national and this is international. It is globalization we are now interconnected more than ever it is amazing to be in a classroom, and something else that I learned from one of the professional development presenters was there are sites where you can schedule conferences with students and with teachers from other countries, and that is culturally responsive teaching right there.

P10 spoke about how having collaboration among colleagues reduces stress factors associated with technology adoption. The perception was that teachers were supportive of each other. PD targeted to personal goals also improved how teachers engaged in PD sessions. Continuous PD sessions allowed the teachers to see how the other teachers used similar resources over time to become comfortable and reduce techno-stressors. P10 spoke about their perception saying that

I think that most teachers are very open to doing it and that everyone is very willing to try to collaborate with one another, especially because they want to grow. So, I think that we have a lot of teachers that do a great job at collaborating with one another. So, I think that is a great thing, because I can see that if teachers are getting more professional development that is more specific, I think they are going to do an even better job at working together. But I think that overall they are very engaged when it comes to working with one another and collaborating as they learn a lot from each other because you can see that a lot of the teachers use similar resources that they pick up during PD.

P3 also shared how much they appreciated collaboration among colleagues and how it reduced stress factors associated with resources that were unfamiliar and learned how to

incorporate them into their lessons, saying, “Much of my own work changed” and “having the opportunity to ask teachers questions right there was very helpful and very convenient.” P2 expressed that they appreciate other teachers’ input on applications that are productively being integrated into their instruction. For new teachers, it is beneficial to have those types of support systems where they can ask questions and receive support from their colleagues.

Summary

The purpose of this qualitative descriptive study was to explore teachers’ perceptions of PD that may improve the technology integration process. Additionally, I wanted to identify stress factors associated with technology adoption and how PD may help to reduce stress factors associated with technology integration in one middle school in New York. I conducted a qualitative descriptive study to explore the teachers’ perceptions of PD opportunities that may improve technology integration and identify stress factors associated with the process. Through semistructured interviews I was able to capture perceptions of teachers that have incorporated technology into their classrooms about the process, resources, and PD opportunities that improve their level of engagement and willingness to adopt technology. I conducted the virtual semistructured interviews using Zoom, then personally transcribed, and manually coded them.

This chapter included an overview of the research questions, data analysis process, and findings of the teachers’ perceptions. The participants were 10 teachers who were currently teaching or had taught at the one middle school in New York. A thematic analysis of the data collection led to the development of the five themes presented above in Chapter 4. Chapter 5 presents a brief review of the problem of practice, purpose statement, methodology, design, results, and limitations. In Chapter 5 I also provide additional analyses of the results, offer recommendations for practice and suggestions for future research.

Chapter 5: Discussion, Conclusions, and Recommendations

The purpose of this qualitative descriptive study was to explore teachers' perceptions of PD that may improve the technology integration process. Additionally, I wanted to identify stress factors associated with technology adoption and how PD may help reduce stress factors associated with technology integration in one middle school in New York. I chose a qualitative descriptive research approach because it allowed me to obtain a deeper understanding of the problem (Yin, 2018). The participants in this study were current and former teachers of this one low-income middle school. The primary tool for data collection was through interviews using Zoom. I transcribed and manually coded the data collected to identify themes and patterns of participants' accounts, characterizing perceptions and experiences relevant to the research questions. The limitations of this research study was the small selection of those whose perceptions were considered, and that only one school was used for the data analysis. This chapter discusses the findings in relation to former research and the research questions. It also presents recommendations for application and future research.

Discussion of Findings in Relation to Past Literature

This qualitative descriptive study's purpose was to explore teachers' perceptions of PD that may improve the technology integration process. Additionally, I wanted to identify stress factors associated with technology adoption and how PD may help to reduce stress factors associated with technology integration in one middle school in New York. Ten former and current teachers from the one middle school shared their perceptions through semistructured interviews. Five themes were developed from the data analysis in relation to the research questions: (1) PD should be hands-on, continuous, and targeted to improve teachers' perception of technology integration in the classroom; (2) teacher buy-in improves through PD geared toward understanding the importance of technology and how technology-infused lessons support

instruction; (3) stress factors associated with technology integration; (4) stress factors are reduced when there is an abundance of technology resources available; and (5) PD that is collaborative reduces stress. Out of those five themes came 10 findings that are discussed below.

The theoretical framework that guided this research was Vygotsky's social constructivist theory that argues that knowledge is co-constructed. Vygotsky's social constructivist theory posited that individuals learn from one another (Vygotsky et al., 1978). Additionally, Bandura's social learning theory also supported this research study. According to Bandura's social learning theory, self-efficacy motivates teachers to integrate technology in the classroom because they believe that they can complete a task successfully. The theory also posits that the improved motivation to learn would reduce stress factors associated with technology integration (Paulus et al., 2020).

Findings From RQ1

What type of PD influences middle-school teachers' perceptions of technology integration? Two themes emerged from RQ1. The first theme is that PD should be hands-on, continuous, and targeted to improve teachers' perception of technology integration in the classroom (Zhang et al., 2021). The second theme was that teacher buy-in improves through PD geared toward understanding the importance of technology and how technology-infused lessons support instruction. There were four findings developed from RQ1, two findings for Theme 1 and two other findings for Theme 2.

Finding 1. PD that is hands-on improves personal levels of engagement. The constructivist theory in PD for technology integration motivates teachers to actively participate in applying knowledge. According to research, learners retain about 90 percent of what they teach to others. This middle school provided professional learning sessions that were teacher-led. This process is supported through ongoing weekly coaching and intensive modeling from other

teachers that involve problem-solving and hands-on practice (Paulus et al., 2020). PD for teachers, according to this type of theory, adds new ideas to current teaching strategies corresponding to technology integration (Paulus et al., 2020). Another critical component of these hands-on sessions was to have follow-ups to identify the working strategies and those that were not (Schrader, 2015)

Finding 2. The second finding is that middle school teachers' perceptions of technology integration improved when PD was continuous. Song and Choi (2017) argued that PD in technology integration should be active, applicable, and continuous. Piaget established that new ideas always emerge from old ones (Sawyer, 2014). Continuous PD opportunities allow for these new ideas to develop. Schrader (2015) shared that acquisition of knowledge should be one that is focused on people's development rather than an end state. Additionally, the PD provided should not be one-day trainings and that administrators should provide additional support or follow-up (Xu et al., 2017).

Finding 3. The third finding was that teachers' perception of PD improved when the learning opportunities were targeted to their personal needs and goals and introduced topics that would improve technology integration. When teachers are given opportunities to question personal ideas and goals to enhance their learning they can construct knowledge for themselves (Zhang et al., 2021). Theorists emphasize that the learning process that continues to build upon what a person has already been taught is more meaningful and more productive (Vygotsky et al., 1978). For the purpose of constructivist application to my research study, learning opportunities should be provided through PD that are targeted to personal interests to become more valuable to the teachers and build upon prior knowledge (Georgiou, 2019).

Finding 4. The fourth finding was related to the importance of technology-infused lessons. In this study, teachers pointed out how technology usage is mandatory in the 21st-

century classroom. The resources are numerous and improve the effectiveness of instructional delivery both now and preparation for the future. Teachers are encouraged to integrate technology into their classrooms to practice the new applications and digital resources that help students master concepts. A way to increase the teachers' understanding and desire to learn is through ongoing training that may improve personal attitudes and share the applications that support lesson delivery that are targeted according to content and to their grade level. Paulus et al. (2020) shared that teachers who perceive they are able to successfully incorporate technology in the classroom become more confident and improve beliefs to apply the new skill into their daily teaching (Swanson et al., 2018). The finding was that teachers need meaningful and content-specific PD to show them the importance of technology integration into their classroom.

Findings From RQ2

Which stress factors are associated with technology integration in the classroom? The third and fourth themes were identified stress factors associated with technology integration in the classroom, and stress factors are reduced when there is an abundance of technology resources available. Four additional findings developed from RQ2. The following are the four additional findings from the data collection process.

Finding 5. Finding number five was that stress factors are found when teachers are not personally comfortable with technology and need to teach their students how to use technology. The teachers shared that two barriers they faced when students work with technology were students' limitations of language and those with learning disabilities. Teachers that were raised with up-to-date computer technology were more comfortable with the technology integration process, while those who began to use these technologies later in life had a slower rate of adoption (Rogers, 1995).

Additional concerns were found when teachers' confidence levels were not as strong. Teachers found it to be intimidating, having 30 students in front of them without proper preparation through PD (Wood et al., 2018). Those that suddenly needed to adapt their lessons to use apps for remote learning as a response to the COVID-19 pandemic had to cope with technostressors due to technology problems. According to the constructivist theory, with adequate resources provided that are current for technology integration, effective learning through PD can occur through modeling, teacher collaboration, and continuity (Sariyildiz, 2017). Gil-Flores et al. (2017) also shared that having a wide range of technology resources available to the teacher reduces stress factors associated with technology integration.

Finding 6. Finding number six was that one major external barrier that causes technostress is when laptops run out of battery power and students are idled. As Howard et al. (2018) reported, technology failure is a normal barrier of the technology integration process into instructional practices. Koster et al. (2017) shared that the lack of available resources, such as software, hardware, tech support, and PD opportunities are external barriers to integrating technology in the classroom.

In today's classroom, teachers are encouraged to be facilitators who guide their students to learn independently so that students take a more active role in their learning process. However, if students are responsible to learn independently and are left without their laptop, being the main resource, then learning is not possible for some time. Therefore, laptops without battery power cause a problem for everyone. One teacher shared that it would scare her to think that she could be observed and be found with a student not working.

Finding 7. Finding number seven is that having an abundance of technology tools improves technology integration and reduces technostress. Powell and Bodur (2019) shared that research has found that technologies support the learning community. Providing an abundance of

technology tools showed to be a support system on its own. The teachers shared about all the resources they had available to them to deliver instruction and how satisfied they were with those technologies.

Finding 8. The eighth finding was that online resources that are content- and grade-targeted improved participants' satisfaction with technology integration. Targeted PD helps teachers' ability to create technology-infused lessons that are specific to the content being learned (Uslu & Usluel, 2019). Varier et al. (2017) posited that incorporating technology into personal teaching practices allows a shift towards a more constructivist style of learning as a way for teachers to move toward utilizing technology incrementally. Constructivist theorists point out that learning is an active process and is done through active participation (Georgiou, 2019). One barrier is that additional time needs to be invested to identify the most effective online resources and this may affect teachers' perceptions (Lawrence & Tar, 2018).

Findings from RQ3

How can PD reduce the stress associated with technology adoption for middle-school teachers? The fifth theme was that collaborative PD reduces stress. Two additional findings developed from RQ3.

Finding 9. The ninth finding was that teachers that are able to ask their colleagues questions and are able to observe what their colleagues are doing with technology in their classrooms reduces technostress. Teachers reported that applications and digital resources require them to invest personal time to learn (O'Neal et al., 2017). Teachers shared that they appreciated when they were allotted time in the school day by the administrators to share with each other. Also, many shared that having the opportunity to share each other's resources reduced the time required to research other applications, and they enjoyed being able to learn from each other. Professional learning communities (PLCs) produce a greater level of

engagement when teachers collaborate to produce meaningful dialogue that develop personal and communal growth (Swanson et al., 2018). The middle-school teachers were responsible for delivering the PD opportunities. Powell and Bodur (2019) shared that when there is effective communication and collaboration among stakeholders, it improves the technology integration process and reduces stress factors. Additionally, PD as related to constructivism would focus on the teacher as the learner, providing an interactive, collaborative learning opportunity (Mohammed & Kinyo, 2020).

Finding 10. The tenth finding was that having other teachers become a support system improves the technology integration process. A vital strategy for school administrators is to foster innovative learning opportunities. Additionally, it is important to develop trustworthy opinion leaders that are in-house and are ready to support others (Masullo, 2017). Teachers are the ones that know what is required for there to be a productive flow in the classroom. Through the learning opportunities offered in PD teachers are able to learn about applications that are working for their colleagues. Moreover, Masullo (2017) spoke about collaboration among the leadership body and their teachers to be crucial when incorporating technology in the classroom. The plan should be periodically revised, and additional training and support should be provided to the teachers (Swanson et al., 2018). This type of support system develops digital citizenship through effective communication.

Communication reduces misunderstandings and stress factors associated with technology integration (Masullo, 2017). Zhong (2017) agreed that if principals and educators collaborate in the technology integration process, student performance also improves. This reduces the stress caused by low standardized test scores and poor teacher evaluations (Raman & Shariff, 2017). Administrators following leadership practices that promote open communication among teachers and colleagues have a more successful outcome. Whether the teachers are encouraged to become

change agents or are allowed to voice their opinions, this type of relationship supports technology usage in the classroom. According to Morgan and Bates (2018), when teachers support one another through applications that they discover are appropriate for their specific content areas and have proven to effectively support learning, the technology integration process is improved. Furthermore, research shows that having teachers supporting each other through teacher-led PD, they can save time by sharing effective practices and resources to incorporate in the classroom (Cheng et al., 2020).

Limitations

The study's limitations were possible interviewer bias and the methodology used for data collection. Qualitative descriptive studies come with some limitations because they recruit a limited number of participants within a specific context; in this case, research was conducted with 10 teachers in one middle school (Noor, 2008; Yin, 2018). Despite these limitations, documenting the experiences and perceptions of the teachers in this middle school can provide other researchers and organizations valuable information about how PD opportunities may affect teachers' perception of technology integration, identify stress factors associated with the process, and explore how PD can reduce these techno-stressors.

The data analysis went through a nonlinear process. I chose to use Braun and Clarke's (2006) six-phase process for thematic analysis. Doing my own transcription of the interviews helped me immerse myself in the teachers' perceptions. Their tone of voice and the information provided allowed me to absorb their thoughts. I also chose to utilize in vivo codes and created an audit trail in hopes of reducing interviewer bias. The participants' responses were organized in tables by themes. To finalize, I used extracts from the teachers' perceptions that related back to the literature to produce the report of the data analysis and validate the perceptions of the participants. Through an audit trail I worked on decreasing interview bias and allowed member-

checking of the semistructured interview transcriptions (Bloomberg & Volpe, 2016). The transcriptions were sent to the participants to ensure they accurately represented their opinions and perceptions regarding implementing technology in their classrooms.

Recommendations

After completing the data analysis, I developed recommendations for this qualitative descriptive study that sought to explore teachers' perceptions of PD opportunities that could improve the technology integration process. Additionally, to identify stress factors associated with technology adoption and how PD may help to reduce stress factors associated with technology integration in one middle school in New York. Although these recommendations evolved from the data collection process and through the findings in this study, I have found that many of these suggestions may apply to a broader audience. Moreover, these recommendations may be considered for the technology integration process at any school desiring to create a smooth transition for teachers to create technology-infused lessons and adopt technology into their instructional practices. I have provided recommendations for practice and for future research below.

Recommendations for Practice

The theoretical framework used to support this qualitative study's results were Vygotsky's social constructivist theory and Bandura's social learning theory. Throughout the data analysis process, both Vygotsky's social constructivist theory and Bandura's social learning theory played an important role in improving the teachers' perceptions of PD and its impact on technology integration. Twelve recommendations were developed from the data analysis based on the theoretical framework that has been divided into two major groups. Recommendations one through eight focused on Bandura's social learning theory that proposes that, as a person's sense of self-efficacy improves, their motivation improves to continue working towards their

goals. Additionally, Bandura's social learning theory encourages belief in personal capabilities to exercise control over events that affect their lives. This theory has to do with the belief that the person can complete a task successfully (Paulus et al., 2020).

Upon completion of the data analysis, I found the PD that is hands-on, targeted, and continuously improves the PD outcome of the teachers' ability to incorporate technology in their classrooms. Another factor was eliminating those external barriers that reduced the teachers' level of control. Recommendations nine through twelve developed from the application of Vygotsky's social constructivist theory that encourages knowledge to be co-constructed and where individuals learn from one another (Vygotsky et al., 1978).

Recommendations Based on Bandura's Social Learning Theory. Administrators should provide PD opportunities that are hands-on to improve teacher's personal level of engagement during PD sessions. In accordance with Theme 1, these types of PD sessions improve teachers' level of personal engagement. PD should be continuous, instead of a one-time session, allowing teachers to engage with concepts, tools, and resources more than once. Theme 1 found how continuous support improved participants' perceptions of technology integration. Additionally, continuous PD sessions improved the teachers' level of understanding and comfort of application as well as improved their rate of adoption. PD should be targeted to support teacher's goals and improve the technology integration process into their instructional delivery in accordance with personal needs.

Recommendations for Theme 2 are associated with the importance of PD showing teachers the why behind technology integration and how technology supports instructional delivery. Therefore, the school administration should continue to provide PD sessions in which teachers can practice with the resources and applications and explore how they would benefit their instructional delivery and have other teachers share about their success with those

resources. This type of support allows teachers the opportunity to practice with the digital tools, applications, and resources before having to integrate the technology into their classrooms.

Theme 3 had to do with identified stress factors associated with technology integration. I found that stress factors associated with technology integration may be due to lack of digital tools and resources. Consequently, having an adequate amount of digital tools, applications, and resources reduces stress factors associated with technology integration and improves teachers' perceptions of technology integration for their instructional delivery. Moreover, the school administration should ensure that there are extra laptop chargers in the classroom to avoid student idleness due to the loss of battery power and ensure that there is a reliable Internet connection. Theme 4 identified that stress factors are reduced when an abundance of technology resources is available. Therefore, the leadership body should have as a priority to provide PD on online resources that are content- and grade-targeted to improve teachers' satisfaction and reduce stress associated with technology integration.

Recommendations Based on Vygotsky's Social Constructivist Theory. The fifth theme was that PD that is collaborative reduces stress. Findings nine and ten developed from RQ3: teachers that are able to ask their colleagues questions and are able to observe what their colleagues do with technology in their classrooms reduces technostress. Having other teachers become their support system improves the technology integration process. For this reason, school administrators should provide time during the school day for teachers to collaborate with each other about technology usage in the classroom.

Another recommendation based on Theme 5 is that teachers should be given the opportunity to share at PD sessions their wealth of knowledge about digital tools, resources, and applications that are effectively working for their instructional delivery. Moreover, teachers would benefit from collaboration with their colleagues regarding their knowledge of appropriate

digital tools, resources and applications that are content-specific and supported by their colleagues. The school's leadership body should create those colleague support systems for teachers to share within the school day and incorporate those opportunities into their programs. The support system could be one where teachers get to share with one another to also answer questions to reduce stress factors and improve the technology integration process.

Recommendations for Future Research

The findings from this qualitative descriptive study allowed me to generate four recommendations for future research to address gaps in the literature. The teachers in this middle school had to adopt technology usage in the classroom when their new administration created a 21st-century technology-infused learning environment. Today, the use of technology to deliver instruction continues to increase as teachers are required to take a more facilitative role, allowing students to access a more extensive range of resources.

Recommendation 1. Based upon the results of this research study, I recommend that follow-up research be conducted after implementing the recommendations made as a result of this study. I also recommend further research to analyze the techno-stressors associated with technology adoption, hardware and software failure, interruption of Internet connections, and other possible barriers to implementing technology in the classroom. Additionally, researchers need to identify the impact that an abundance of technology resources has on reducing stress factors associated with the technology integration process (Dong et al., 2020; Howard, 2018).

Recommendation 2. I also recommend recruiting participants from multiple schools to assist with gathering a wider range of perceptions regarding how PD impacts technology integration and reduces techno-stressors. The limitation of having participants from only one school is that it can create bias where their perception is from this one atmosphere, and it may

limit the transferability of the results to other settings (Yin, 2018). Also, data collection of participants from different schools may yield different results.

Recommendation 3. Another recommendation would be future research to explore how targeted and continuous PD promotes self-efficacy and impacts teachers' experiences with integrating technology in the classroom. A phenomenological study would allow the researcher to explore the teachers' experiences and focus on how PD improves teachers' perception of self-efficacy in their ability to incorporate technology in the classroom. Another possible research method would be grounded theory, which would entail the systematic collection and analysis of data used to uncover social relationships of the teachers' abilities and experiences with technology and PD to encourage their growth. Moreover, researchers should conduct studies on how PD sessions that are content specific and continuous impact the delivery of technology-infused lessons.

Recommendation 4. I also recommend that further research be conducted on teachers' perceptions of asynchronous PD opportunities that are completely online. Additionally, I recommend research to explore the ability of asynchronous PD to create opportunities for more targeted sessions for teachers. Researchers especially need to explore the impact of asynchronous PD opportunities on cost reduction, its ability to expand the range of PD for a smaller group of stakeholders, and how cost-effective PD may improve administrators' budget. Finally, future research should explore the ability to create collaborative opportunities through these asynchronous PD opportunities (Yoon et al., 2020).

Conclusions

In this descriptive qualitative research study, I wanted to address the problem of teacher attrition, possibly related to stress factors associated with the need to implement technology in their classrooms (Mitchell et al., 2017). Despite efforts to support teachers' use of technology in

the classroom, other concerns have developed (Zhang et al., 2021). The purpose of this qualitative descriptive study was to explore teachers' perceptions of PD that could improve the technology integration process. Additionally, I wanted to identify stress factors associated with technology adoption and how PD may help to reduce stress factors associated with technology integration in one middle school in New York. A qualitative descriptive study allowed me to get an overall view of the PD that could improve the technology integration process in this one middle school (Bradshaw et al., 2017).

Technology integration became a worldwide focus for schools after remote learning was necessary to continue with instruction due to the COVID-19 pandemic (Wood et al., 2018). This qualitative descriptive study captured middle school teachers' perceptions through semistructured interviews to analyze middle-school teachers' perceptions as the main instrument for this descriptive qualitative research (Korstjens & Moser, 2018). Although technology has shown to help teachers provide students with a greater range of resources to learn, very little research has examined the added stress factors teachers experience due to the technology adoption process (Raman & Shariff, 2017). Additionally, further research should be conducted to provide additional insight on teachers' perceived benefits and motivation for technology integration to adopt the technology or how the stress factors associated with the technology adoption process possibly increase teacher attrition.

This qualitative descriptive study explicated the perceptions of teachers in one middle school, in New York, regarding stress factors that are associated with the technology integration process. Ten teachers shared their perceptions through open-ended semistructured interviews. The interview protocol was developed with the support of a panel of experts to ensure that the answers would produce a rich description of their perceptions about PD that improves

technology integration. Five themes emerged from the teachers' responses that were thematically analyzed.

Themes Developed From Data Analysis of RQ1. What type of PD influences middle-school teachers' perceptions of technology integration? The data analysis was organized by research question. The first two themes allowed me to answer RQ1: PD should be hands-on, continuous, and targeted to improve teachers' perception of technology integration in the classroom developed (Zhang et al., 2021). The second theme was that teacher buy-in improves through PD geared toward understanding the importance of technology and how technology-infused lessons support instruction. There were four findings developed from RQ1, two findings for Theme 1, and two other findings for Theme 2: (1) PD that is hands-on improves personal levels of engagement; (2) Middle-school teachers' perceptions of technology integration improve when PD is continuous; (3) Teachers reported a steep learning curve through PD that was targeted to their personal needs and personal goals and that improved their technology integration; (4) Technology-infused lessons are mandatory in the 21-century classroom.

Themes Developed From Data analysis of RQ2. Which stress factors are associated with technology integration in the classroom? There were two more themes developed from the data analysis for RQ2. The third and fourth themes were identified stress factors associated with technology integration in the classroom, and stress factors are reduced when there is an abundance of technology resources available. Findings five through eight developed from these two themes of RQ2: (5) Stress factors are found when teachers are not personally comfortable with technology and need to teach their students how to use technology; (6) One major external barrier that causes technostress is when laptops run out of battery power and students are left idle; (7) Having an abundance of technology tools improves technology integration and reduces

technostress; (8) Online resources that are content- and grade-targeted improve teacher satisfaction with technology integration.

Themes Developed From Data Analysis of RQ3. How can PD reduce the stress associated with technology adoption for middle-school teachers? The fifth theme was PD that is collaborative reduces stress. Findings nine and ten developed from RQ3: (9) Teachers that are able to ask their colleagues questions and are able to observe what their colleagues do with technology in their classrooms reduces technostress; and (10) Having other teachers become their support system improves the technology integration process.

Overall, this qualitative descriptive study on PD that could influence teachers' perceptions of the technology integration process in one low-income middle school in N.Y. brought a clearer understanding of stress factors associated with technology integration in hopes of reducing teacher attrition (Player et al., 2017). I included an exposition of the literature sources, discussed the study's theoretical framework, provided a synthesis of the research findings, and provided recommendations for practice and future research. I found that PD should be hands-on, continuous, and targeted to increase teachers' personal level of engagement (Lin et al., 2015). Additionally, creating opportunity for collaboration and creating colleague support systems reduce stress factors associated with technology integration. These peer support systems reduce time required to research the most effective resources, digital tools, and applications as they share with one another the most effective resources. Therefore, providing adequate PD, appropriate infrastructure, and training would be advantageous for teachers to feel more comfortable developing technology-infused lessons.

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Appendix A: Interview Protocol

Interview Protocol

Date: _____

Zoom video or phone conference: _____

Interviewer: Dayana Nunez

Interviewee: First name, Last name (The name you are providing is strictly for my personal use as the researcher. Your identities will be kept completely confidential.)

Instructions: I, as the interviewer, will follow these standardized procedures for each interview.

After I have greeted and done an introductory ice-breaker conversation, I will ask the semi structured research questions from the protocol with additional follow-up questions whenever necessary. After the interviews are completed, I will thank the participants and acknowledge their valuable time spent on the interview.

Table A1 *Data Collection Matrix*

Research Question	Interview Questions
1. What type of professional development influences middle-school teachers' perceptions of technology integration?	<ul style="list-style-type: none"> • Describe a typical professional development session at your school. • Describe professional development opportunities you feel would support your use of technology in the classroom? • Describe how professional development opportunities would improve your comfort level to productively integrate technology in your classroom? • How would you describe your personal level of engagement during a typical professional development session? • a. What factors might impact(improve) your level of engagement? • How has professional development improved technology usage in your classroom instruction? • Describe your feelings related to the professional development opportunities

	provided at your school related to technology integration.
2. What stress factors are associated with technology integration in the classroom?	<ul style="list-style-type: none"> • How has professional development improved technology usage in your classroom instruction? • Describe your feelings related to the professional development opportunities provided at your school related to technology integration. • Tell me about your comfort level of using technology in general? • Tell me about your comfort level of using technology to deliver instruction? • What part of integrating technology in the classroom makes you most uncomfortable? • Describe your experience and feelings associated with implementing technology. • Elaborate the phrase “I would prefer (not) to use technology in the classroom” because... • How do(did) you feel about using the software and apps provided by the school? • How do(did) feel you with the speed of the internet connection available at your school? • Describe the reliability of the internet connection at your school? • Describe the level of reliability of technical support you would like to receive for technology integration? • How do you feel about the time provided by the leadership for technology integration before they do(did) evaluations?
3. How can professional development reduce the stress factors associated with technology adoption for middle school teachers?	<ul style="list-style-type: none"> • What kind of professional development would you say can help you productively use technology in the classroom? (Prompt if needed) • Describe a time when you believe that the professional development activity was especially helpful in the classroom.

-
- Describe the type of technology and instructional support you would like to receive from professional development opportunities to make you feel successful in implementing technology.
 - Describe how you feel about collaboration among colleagues during professional development.
 - Describe the level of support you would like provided after professional development to make you feel comfortable with technology integration?
-

Table A2 *Expert Panel Qualifications*

Reviewer #1	Has a PhD degree and great expertise in the area of education. With 35 years of experience in doctoral education, she has done much research and has guided dozens of doctoral candidates and created interview protocols.
Reviewer #2	Has earned an EdD and has 16 years of experience in instructional design and faculty development. His area of expertise is in instructional design, diffusion of innovations, and faculty adoption of technology. He currently works in instructional design and faculty development at the Adams Center for Teaching and Learning as the Director of Instructional Design at Abilene Christian University.
Reviewer #3	Has a PhD in Educational Administration and Human Resource Development with 15 years of experience. Her area of expertise is in human resource development, and currently works as an assistant professor in Education.

Reviewer #4	Has a PhD in Higher Education Research from Texas Tech University with 15 years of experience in research design, methodology, linguistics, theology, disability rights, higher education studies. His field in academic administration is exceptional. Currently works on research and design innovations in online program development and delivery, focusing on students' experiences typically marginalized in higher education (students with disabilities, underrepresented minority students, low-income students, first-generation students, underprepared students).
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Appendix B: IRB Approval

ABILENE CHRISTIAN UNIVERSITY

Educating Students for Christian Service and Leadership Throughout the World

Office of Research and Sponsored Programs

320 Hardin Administration Building, ACU Box 29103, Abilene, Texas 79699-9103
325-674-2885

June 22, 2021



Dayana Nunez
Department of Organizational Leadership
Abilene Christian University

Dear Dayana,

On behalf of the Institutional Review Board, I am pleased to inform you that your project titled "A Descriptive Qualitative Study Exploring Teachers' Perceptions of Professional Development on Technology Integration",

(IRB# 21-072)is exempt from review under Federal Policy for the Protection of Human Subjects.

If at any time the details of this project change, please resubmit to the IRB so the committee can determine whether or not the exempt status is still applicable.

I wish you well with your work.

Sincerely,

Megan Roth

Megan Roth, Ph.D.
Director of Research and Sponsored Programs