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The Relationship Between New Jersey Primary Teachers' Perceptions of One-to-One Device Programs and Their Stage of Adoption

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This is to certify that the doctoral dissertation by

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and that any and all revisions required by
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Walden University
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Abstract

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Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

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Abstract

Interest in one-to-one (1:1) device programs, where schools provide each student with their own computing device, has increased across the United States. The problem this study addressed was whether primary teachers' perceived usefulness, ease of use, organizational support, and technical support of a 1:1 device program is related to their reported stage of adoption. The purpose of this quantitative study was to examine the relationship between primary school teachers' perceptions of a 1:1 device program and their self-reported stage of adoption. The theoretical framework guiding the study included the diffusion of innovations theory and the technology acceptance model. Data were collected using convenience sampling through a digitally deployed survey composed of the Stages of Adoption of Technology Survey and the Freedom to Learn-Teacher Technology Questionnaire. There were 93 participants, and data analysis was conducted using ordinal logistic regression to determine whether teachers' stage of adoption was related to their perceived ease of use, perceived usefulness, perceived organizational support, and perceived technical support. The findings indicated that perceived ease of use, perceived usefulness, perceived organizational support, and perceived general technical support had a significant positive relationship to teachers' stage of adoption. The findings may inform those in the educational field about factors related to increasing teacher technology acceptance and teachers' stage of adoption, as well as how to promote buy-in among teachers on technology initiatives.

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Dedication

I dedicate this dissertation to my daughters, Marie Elena Dominguez and Isabella Rose Dominguez. Making positive change is something I greatly believe in. I want to ensure you grow up in a world in which children are empowered using educational technology in the classroom to be provided with access, accessibility, and the means to pursue educational interests inside and outside of the traditional classroom. Technology opens the doors to a world beyond the classroom, and I hope your future achievements can go far beyond my own. Making this world a better place for you is my goal. In addition, my beloved husband, Fabio Dominguez. You have always believed in me and supported me through some of my life's most challenging times. Although everyone told me that pursuing my PhD was not worthwhile, you believed in me and what I could achieve. I would not have gotten through this doctoral journey. I love you. Thank you.

I also dedicate this dissertation to two key figures in my life: my parents, Marie and Salvatore Amato, who always told me that I could accomplish anything I put my mind to. I have wanted to get a doctorate since I was a teenager, and they always encouraged me to reach for my dreams.

In the loving memory of my mother, Marie Amato, this doctorate is for you and achieved because of you. I love you; I miss you and thank you for always being there for me.

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I want to acknowledge the unwavering support and dedication given to me throughout this enlightening doctoral journey by my excellent committee chair. Dr. Amy Adcock, without your support through some challenging times in my doctoral journey, I would not be completing it. I could not have asked for a better mentor throughout this process. It has been a fantastic experience, and I am very thankful you are mentoring me through this process. I would also like to thank my outstanding committee members, Dr. Hammett and Dr. Baltes, for their academic expertise, support, guidance, and encouragement throughout the process.

In addition, a special thanks to Dr. Rhonda Christensen for allowing the use of the Stages of Adoption survey, as well as to the Center for Research in Educational Policy (CREP) for its permission for my use of its copyrighted Freedom to Learn-Teacher Technology Questionnaire (FLT-TTQ).

Table of Contents

List of Tables

List of Figures

Chapter 1: Introduction to the Study

Educational technology surrounds practices and principles of education. Over the last 2 decades, the use of educational technology in the classroom has allowed for shifting practices around teaching and learning, supporting positive outcomes in the classroom. Ross (2020) noted how the expansion and use of technology in schools occur during times of growth in school accountability and high demands on teachers over expectations. With the evolving role of technology in the classroom, research has shown that teachers within one-to-one (1:1) device classrooms need to shift their use of technology in classroom practice. The shift from teacher-centered to student-centered classroom practice can be achieved by incorporating 1:1 devices and providing differentiated instruction to meet students' needs (Parrish & Sadera, 2020; Turkuresin, 2021). Ross discovered that using 1:1 devices in schools is designed to infuse digital skills and provide equitable access to technology while promoting higher order learning, which can often be misunderstood.

In K–12 education, technology has been the focus in schools to push educational initiatives, creating significant changes in the role of the teacher and education, which is reflected in the classroom (Calderon & Carlson, 2019; Parrish & Sadera, 2020). The U.S. Department of Education (2017) explained the importance of providing 1:1 devices for teachers and giving access to these tools for effective learning technology in the classroom, which impacts student learning. The U.S. Department of Education reported the importance of providing ongoing support and professional development to create an effective technology-focused classroom. Teachers were provided with 1:1 devices in their

classrooms; however, there has been a lack of training to explain how to effectively use these devices in the classroom to cultivate a positive learning environment (Francom, 2020; Parrish & Sadera, 2020). Teachers' perceptions of educational technology, such as 1:1 devices in the classroom, and its value continue to evolve as technology becomes ubiquitous in classroom culture (Hallman, 2019; Harper & Milman, 2016; Lawrence et al., 2018; Ross, 2020). Although there has been some research on how teachers perceive using 1:1 devices to create effective learning outcomes (Hallman, 2019; Harper & Milman, 2016; Parrish & Sadera, 2020; Scherer et al., 2019, 2020), more research could clarify how to support teachers and promote their acceptance of 1:1 devices in the classroom. de

In a 1:1 device program, each student uses an individual device to complete work in the classroom. The use of 1:1 instructional technology is prevalent in primary schools and contributes to supporting academic achievement in the classroom (De Melo et al., 2017; Turkuresin, 2021). Teachers' perceptions and beliefs pertaining to technology's ease of use, usefulness, organizational support, and technical support can create a barrier to technology integration, excluding an essential educational tool for students (Francom, 2020; Regan et al., 2019; Tondeur et al., 2017). Teachers are classroom-level decision makers, and their perceptions affect the widespread adoption of instructional programs, tools, and strategies. Teachers hold the key to successfully adopting 1:1 devices in their classroom activities (Francom, 2020; Parrish & Sadera, 2020; Tondeur et al., 2017). Teacher perceptions need to be understood to support the use of 1:1 device programs in schools.

This chapter entails a review of the background of 1:1 devices in schools and the purpose of this quantitative nonexperimental study. In addition, the research questions are provided along with the theoretical framework: the diffusion of innovation (Rogers, 2003) and the technology acceptance model (TAM; Davis, 1989). In addition, the assumptions, limitations, and potential significance of the study are discussed.

Background

Educational institutions are embracing technology to support progress and change while investigating new opportunities to reimagine teaching and learning despite previous and current perceptions about the value of technology in education (Hallman, 2019; Harper & Milman, 2016; Lawrence et al., 2018; Parrish & Sadera, 2020). Studies have examined 1:1 devices in education and their impact on our daily lives. (Durff & Carter, 2019; Francom, 2020; Tondeur et al., 2017). Findings indicated that schools still struggle with barriers and challenges faced by teachers who do not use technology in the classroom consistently and effectively (Durff & Carter, 2019; Francom, 2020; Peterson & Scharber, 2017).

Studies found that although teachers are aware of the benefits of technology such as 1:1 devices for teaching and learning in the classroom, their perceptions can be barriers to their adoption (Cheng et al., 2021; Kihoza et al., 2016; O'Neal et al., 2017; Scherer et al., 2019; Steed & Leech, 2021; Vongkulluksn et al., 2018). Bergström and Wiklund-Engblom (2022) explored how teacher practice is affected by 1:1 devices. In their study, teachers' beliefs were found to be essential to how they implemented new digital tools in their classrooms. This study supported the need to better understand

teachers' beliefs and perceptions regarding the adoption of 1:1 devices in schools. Bergström and Wiklund-Engblom discovered how the teacher is the key figure who has the power and can control the adoption within the classroom. Rogers's (2003) and Davis's (1989) research, with its current application to teachers' technology adoption and the factors that affect adoption, shows the limitations and applications of this research.

Programs with 1:1 devices are a classroom environment in which each student is assigned a personal learning device such as a laptop computer, Chromebook, iPad, or tablet connected to the internet (Harper & Milman, 2016; Hershkovitz & Karni, 2018). At the time of the current study, there was minimal research primary teachers' technology acceptance and how it relates to their acceptance of a 1:1 device program (Bergström & Wiklund-Engblom, 2022; Harper & Milman, 2016; Ross, 2020; Solomon, 2017).

In studies related to 1:1 device programs, researchers attempted to understand how this initiative influences teaching and learning. Lawrence et al. (2018) explained how the teacher's perception of a program could change the way they collaborate with other educators by sharing their knowledge to improve practice in the classroom. The current study investigated the teachers' needs by exploring primary teachers' perceptions and factors that support the successful adoption of 1:1 devices in the classroom.

The recent literature did not provide extensive research into 1:1 devices at the primary level. The current study addressed what factors influence the technology acceptance of primary teachers who adopt 1:1 devices in the classroom. Recent studies addressed teachers' technology acceptance in the 1:1 environment at the college and high school level (Bergström & Wiklund-Engblom, 2022; Gherardi, 2020; Hallman, 2019;

Khlaif & Salha, 2022; Li et al., 2019; Peterson & Scharber, 2017; Vongkulluksn et al., 2018; Xu & Zhu, 2020; Yanguas, 2020). Although some research had been conducted at the primary level (Bergström & Wiklund-Engblom, 2022), it was unclear whether there is a significant relationship between teachers' perceived usefulness, perceived ease of use, perceived organizational support, and perceived technical support relate to their use of 1:1 devices in the classroom and their reported stage of adoption.

Problem Statement

A persistent educational trend is integrating computers into all instructional practices (Harper & Milman, 2016; Ross, 2020). This trend has led researchers to examine the appropriate role of computer-based technology as a teaching tool in the classroom and how teacher attitudes shape this role *(*Khlaif, 2018). Teachers' perceptions can be a barrier to technology integration, influencing how teachers use technology in their classrooms (Alizadehjamal & Keyhan, 2021; Khlaif, 2018; Lawrence et al., 2018). The introduction of new approaches to integrating computer technology such as 1:1 device programs into educational settings can result in varied perceptions among teachers, such as their level of technology acceptance and views of how technology can be used as a teaching tool (Alizadehjamal & Keyhan, 2021; Hallman, 2019; Khlaif, 2018; Xu & Zhu, 2020).

Although research examined the relationship between teachers' perceptions and technology acceptance of programs using 1:1 instructional technology in high school classrooms (Bergström & Wiklund-Engblom, 2022; Gherardi, 2020; Hallman, 2019; Khlaif & Salha, 2022; Li et al., 2019; Vongkulluksn et al., 2018; Xu & Zhu, 2020;

Yanguas, 2020), there was minimal scholarly research on teachers' perceptions of the factors such as ease of use, usefulness, and organizational and technical support that affect the acceptance of 1:1 instructional technology programs in primary schools. Primary teachers use these tools, yet there was a lack of research on the relationship between adoption factors and teachers' perceptions and acceptance of technology. The effective use of 1:1 devices is related to teachers' willingness to accept change (R. Christensen & Knezek, 2017; Scherer et al., 2019). Urbina and Polly (2017) found that even when 1:1 instructional technology is provided to teachers, it is often not correctly used. The problem the current study addressed was whether the perceived usefulness, ease of use, organizational support, and technical support of primary teachers' technology acceptance of a 1:1 device program is related to their reported stage of adoption (see Alizadehjamal & Keyhan, 2021; Bergström & Wiklund-Engblom, 2022; Francom, 2020; Hallman, 2019; Harper & Milman, 2016; Khlaif, 2018; Regan et al., 2019; Ross, 2020; Solomon, 2017; Tondeur et al., 2017; Xu & Zhu, 2020).

Purpose

The purpose of this quantitative study was to examine the relationship between New Jersey primary school teachers' technology acceptance of a 1:1 device program and their perceived usefulness, ease of use, organizational support, and technical support impact on their reported stage of adoption. The study addressed how primary teachers' perceived usefulness, perceived ease of use, perceived organizational support, and perceived technical support related to their stage of adoption of technology in classroom activities.

Research Questions and Hypotheses

The study was guided by the following research questions (RQs) and hypotheses:

RQ1: What is the relationship between teachers' self-reported perceptions of 1:1 device programs' usefulness and their stage of adoption?

$H_0$1: There is no significant relationship between teachers' self-reported perceptions of 1:1 device programs' usefulness and their stage of adoption.

H_a1: There is a significant relationship between teachers' self-reported perceptions of 1:1 device programs' usefulness and their stage of adoption.

RQ2: What is the relationship between teachers' self-reported perceptions of 1:1 device programs' ease of use and their stage of adoption?

$H_0$2: There is no significant relationship between teachers' self-reported perceptions of 1:1 device programs' ease of use and their stage of adoption.

H_a2: There is a significant relationship between teachers' self-reported perceptions of 1:1 device programs' ease of use and their stage of adoption.

RQ3: What is the relationship between teachers' self-reported perceptions of organizational support of 1:1 device programs and their stage of adoption?

$H_0$3: There is no significant relationship between teachers' self-reported perceptions of organizational support of 1:1 device programs and their stage of adoption.

H_a3: There is no significant relationship between teachers' self-reported perceptions of organizational support of 1:1 device programs and their stage of adoption.

RQ4: What is the relationship between teachers' self-reported perceptions of technical support of 1:1 device programs and their stage of adoption?

$H_0$4: There is no significant relationship between teachers' self-reported perceptions of technical support of 1:1 device programs and their stage of adoption.

H_a4: There is a significant relationship between teachers' self-reported perceptions of technical support of 1:1 device programs and their stage of adoption.

Theoretical Framework

This study's theoretical framework included the diffusion of innovation theory (Rogers, 2003) and the TAM (Davis, 1989). The diffusion of innovation theory explains how innovative technology became accepted in society and how individuals have adopted it by using this technology over time. The diffusion of innovation theory explains the rates at which an idea gains momentum, how different groups of people will come to accept the idea, and how this idea is then used or diffused into a population. In the current study, I examined how 1:1 devices are incorporated into teachers' educational practices. The theory of the diffusion of innovations was used to explain how technology is adopted in an institution such as schools.

Hubbard (2014) examined the effectiveness of programs and initiatives by understanding decision making and evaluation through statistical measurement. Research conducted by Creswell (2014) and Hubbard (2014) set the stage for a thorough investigation of how technology affects education through quantitative research. Solomon

(2017), and Akman and Koçoglu (2017) used Rogers's (2003) framework to examine the relationship between teachers and their level of technology acceptance. Rogers discussed how perceptions of teachers can play a vital role in whether they adopt technology into classroom activities. In the current study, this theory provided insight into assessing teachers' current stage of adoption. I used Rogers's diffusion of innovation to extend existing diffusion by examining the teachers' stage of adoption, which indicated their willingness to accept the innovation.

The second part of the framework was Davis's (1989) TAM. The TAM explains how a person's perception can affect how they accept or reject technology. By using Davis's TAM, a practitioner can pinpoint factors contributing to identifying why technology has been accepted. Davis's TAM extended Rogers's (2003) diffusion of innovation. Davis's model offered some insights into the perceived ease of use and usefulness that may influence an individual's decision making regarding the acceptance of new technology. These theories contributed to the current study by clarifying what factors contribute to the acceptance of technological innovation.

The current study explored the factors of perceived usefulness, perceived ease of use, perceived organizational support, and perceived technological support that affect a teacher's acceptance of the technology. I gathered data on the relationship between adoption factors and teachers' perceptions of 1:1 technology integration in classroom practices. Scherer et al. (2019), Solomon (2017), and Rienties et al. (2016) used Davis's TAM to investigate the relationship between teachers' technology use and acceptance of

innovative technology. A relationship may exist between the two variables and how the teachers' perceptions of educational technology impact its use in the classroom.

Rogers (2003) examined how individuals start to process an acceptance of new technology. Davis's (1989) TAM extended Rogers theory, offering insights into factors that influence an individual's decision making regarding the use and acceptance of new technology. Using the TAM allowed the current study's findings to be generalized (see Scherer et al., 2019) by allowing the study to be replicated in other settings. The TAM offered guidance on what factors may improve technology use by assessing a particular technology, such as a 1:1 device program (see Henderson & Milman, 2020; Scherer et al., 2019, 2020). The current study examined the relationship between New Jersey primary school teachers' perceived usefulness, perceived ease of use, perceived organizational support, and perceived technical support and teachers' technology acceptance of 1:1 devices through their reported stage of adoption of technology in classroom activities. Using these frameworks allowed me to gather data on teachers' perceptions of 1:1 technology integration into classroom practices.

I combined Rogers's (2003) and Davis's (1989) theories to examine how teachers accept a technology based on the reported perspectives of teachers' adoption of 1:1 technology in classroom activities. These two theories allowed me to understand the teachers' perception of 1:1 programs and how it affects their use of 1:1 devices in the classroom. The increase in 1:1 programs has led to an educational shift of technology-based instruction in the classroom (Hallman, 2019; Lawrence et al., 2018; Ross, 2020; Turkuresin, 2021; Wongwatkit et al., 2017). Davis's TAM identifies perceived ease of

use and perceived usefulness to establish why technology users accept or reject a given technological innovation (Davis, 1989). The TAM describes how these two constructs determine a person's behavioral intention to use devices. With this change, it was essential to understand teachers' perceptions of this technology and the relationship between 1:1 devices and their use in the classroom.

An examination of research in areas using 1:1 technology indicated a positive and significant relationship between "the effective use of mobile resources and the respondents' age" (Camilleri et al., 2017, p. 46). Camilleri et al. (2017) found a significant relationship between the perceived usefulness of digital learning resources, the respondent's age, perceived ease of use, and the respondent's gender. The study revealed that teachers were not highly confident in using mobile technologies in their lessons in the classroom. The results also suggested that teachers may require their organization to provide technical support, professional development, and training to properly support their classroom integration. The positive effects of 1:1 technology in the classroom required further research to understand how to encourage teachers to be willing to integrate this technology into classroom activities.

Teachers' willingness to change their classroom practices to include 1:1 technology is influenced by their perceptions of the technology's ease of use and the usefulness of the technological tool (Davis, 1989; Henderson & Milman, 2020; Marangunic & Granic, 2015; Scherer et al., 2019, 2020). Teachers who employ instructional practices through technology could positively impact the development of

more effective educational practices (C. M. Christensen & Eyring, 2011; C. M. Christensen et al., 2011).

Nature of the Study

The current study had a nonexperimental quantitative design. This design was selected to examine the relationship between perceived usefulness, perceived ease of use, perceived organizational support, and perceived technical support and teachers' reported stage of adoption in the 1:1 device program. Solomon (2017) used an online survey that combined R. Christensen's (1997) Stages of Adoption survey and Lowther et al.'s (2000) Freedom to Learn-Teacher Technology Questionnaire. Solomon's survey contained items designed to understand high school teachers' usefulness, ease of use, organizational support, and technological support and how these factors relate to their technology acceptance. The current study used a quantitative ordinal logistic regression approach to examine the relationship between teachers' ease of use, usefulness, technical support, and organizational support and teachers' stage of adoption of 1:1 devices in the classroom. A qualitative approach was not appropriate because the research focused on numerical data and statistical analysis to determine its results.

Keenan (2022) noted that qualitative research uses data that can be observed rather than numerically measured. For qualitative research, such as interviews, the researcher seeks to understand the population and look for structure, order, or patterns in the data (Keenan, 2022), which was not the purpose of the current study. Kennan added that "unlike quantitative researchers, qualitative researchers do not measure or manipulate variables. Instead, they allow meaning to emerge from the research

participants" (Keenan, 2022). Interviews would have provided more specific information about the individual rather than quantifying the factors and their relation to teachers' stage of adoption. Creswell (2009) identified how a survey could be used as an appropriate means to quantify or numerically describe a sample population's trends, behaviors, attitudes, perceptions, or opinions. An ordinal logistic regression analysis was used to quantify the relationship between New Jersey primary school teachers' perceived usefulness, perceived ease of use, perceived organizational support, and perceived technical support and teachers' reported stage of adoption of 1:1 technology devices in classroom activities.

Definitions

1:1 technology: A learning environment in which each student has a personal computing device such as a laptop, Chromebook, iPad, or tablet connected to the internet for use during classroom instruction (Harper & Milman, 2016; Hershkovitz & Karni, 2018; Solomon, 2017).

1:1 teacher device program: Initiatives in which teachers and students are provided their own device to facilitate individual access to various technology-based resources for teaching and learning (Curry et al., 2019; De Melo et al., 2017; Harper & Milman, 2016).

Factors affecting technology use: Factors that impede the acceptance and use of 1:1 technology in the classroom (Durff & Carter, 2019; Francom, 2020; Goodwin et al., 2015; Kihoza et al., 2016; Tondeur et al., 2017).

Pedagogy: The methods and practices involved with teaching (Daniels, 2016).

Perceived ease of use: The extent to which teachers feel that 1:1 technology use in class activities will be free of effort (Davis, 1989, 1993; Marangunic & Granic, 2015).

Perceived organizational support: Variables related to the overall support of the 1:1 technology program by the faculty, administration, technology team, students' caregivers, and community stakeholders (Davis, 1989, 1993; Lowther et al., 2012).

Perceived technical support: A person, coach, or lead teacher whom a teacher may use for technical support, as well as the availability of professional development and training for 1:1 technology (D. Lowther et al., 2012).

Perceived usefulness: The extent to which teachers feel that 1:1 technology will enhance their work performance (Davis, 1989, 1993; Marangunic & Granic, 2015).

Primary teachers: Teachers who work with students from kindergarten through eighth grade.

Stage of adoption: Teachers' stated level of use of 1:1 technology in classroom pedagogies (R. Christensen, 1997).

Teachers' perceptions: The attitudes, views, or beliefs of teachers that predict their technology integration and affect their use of 1:1 technology for educational activities (Francom, 2020; Li et al., 2019; Zheng et al., 2016).

Assumptions

I assumed that all participants would understand this study's nature, purpose, and topic to contribute to the survey. To ensure all participants had a clear sense of the nature of the study, its purpose, and its topic, I provided the participants with the context of the study as part of the informed consent. In addition, I assumed that all participants would

provide honest and truthful responses by showing their current level of technology acceptance and reflecting on their experience with the 1:1 device program. In addition, I assumed that the participants were satisfied with the ethical standards of the study. Participants were assured that the survey would be anonymous. In addition, participants were assured the data collected for the study would be used for the exclusive purpose for which the data were collected.

In addition, I assumed that teachers who volunteered for the study met the inclusion criteria. These assumptions were necessary because before conducting the study, I was not aware of the experiences of these primary teachers. Therefore, I assumed that there would be a variety and range in the responses and perceptions because participants possessed different years of experience and technological experiences. I assumed this variety would provide a diverse data set that accurately reflected teachers' perceptions. These assumptions were essential to guiding the research while limiting researcher and participant bias.

Scope and Delimitations

This study attempted to measure the relationship between teachers' perceived usefulness, ease of use, reported organizational support, and technical support and their reported stage of adoption in the 1:1 device program. The data allowed me to examine how primary teachers view the 1:1 program and their perceptions of these 1:1 programs. The research problem addressed factors affecting technology adoption. The population that was excluded from the study included teachers who taught outside of New Jersey,

teachers who taught in high school and beyond, and teachers in a nonteaching role. Teachers who participated in this study were primary teachers who teach children.

During this research, the technological pedagogical and content knowledge framework was considered to understand primary teachers and their technology acceptance. This framework was considered because it addresses the technological knowledge of teachers. The framework provides a global picture of how to teach with technology; however, it was rejected because a significant component of the framework is content knowledge for teaching using technology, which was not part of the current study. The delimitations of this research narrowed the range of this study to public teachers employed in schools in New Jersey. The study sample size may be considered a delimiter in that the Likert-style survey was subjected to potentially limited responses within the schools, which relied on teachers agreeing to participate. Another potential delimitation was the teachers' inability to devote time to participating in the survey.

External validity may be limited because the study was restricted by location and the number of participants. However, the study allowed for generalization using the Likert survey tool. This survey accurately measured teachers' perceptions of factors affecting technology acceptance. Although the study was limited to a group of teachers from New Jersey, the information gathered in this study provided valuable information on the perceptions of primary teachers who use the 1:1 device program. This information may add to the body of research, ensuring that the perceptions of primary teachers are represented when understanding technology acceptance in education.

Limitations

A potential barrier to collecting primary survey data included recruiting participants; also, teachers who were interested in technology or positively perceived technology may have been more likely to volunteer for the study. Additional limitations were enthusiastic supporters of the technology. Teachers with a favorable view of technology and a positive view of a 1:1 device program may have been more inclined to represent their experiences positively. Teachers who fell into the late majority or laggard category, who do not like the use of technology, and who do not support integrating 1:1 devices into classrooms may have shared a negative view and may have been less likely to volunteer for the study (see Rogers, 2003). The COVID-19 pandemic impacted the continued use of technology in the classroom as teachers transitioned into a remote learning format. Teachers who transitioned into a remote learning format may perceive the continued use of technology positively and negatively due to this experience. Teachers who struggled with remote instruction may have shared a negative perception that was not a true reflection of using 1:1 devices in the classroom. In contrast, teachers who had positive experiences may have shared a more positive perception of 1:1 devices in the classroom.

Significance

This study examined the integration of a 1:1 device program in primary classrooms by examining the relationship between primary teachers' reported stage of adoption and their perceived usefulness, ease of use, organizational support, and technological support. Prior research demonstrated how teacher perception is critical in

adopting technology in the educational environment (Admiraal et al., 2017; Alizadehjamal & Keyhan, 2021; C. M. Christensen & Eyring, 2011; C. M. Christensen et al., 2011; Ikenouye & Clarke, 2018; Xu & Zhu, 2020). Understanding teacher perceptions of these four factors is essential in the widespread adoption of instructional approaches using 1:1 technology in the educational environment (see Alizadehjamal & Keyhan, 2021; Scherer et al., 2019, 2020; Solomon, 2017; Xu & Zhu, 2020).

The current study aimed to provide further insight for school leaders in their decision-making practices to integrate technology such as 1:1 instructional technology into a primary school's curriculum. The findings provided a better understanding of teacher perceptions and future interventions to influence the widespread adoption of 1:1 technology in the classroom. The research has the potential to lead to the identification of adopter groups of teachers with shared demographics or perspectives. By understanding teachers' level of adoption and their adopter groups, findings may inform decision makers about the need for teacher professional development, technology and curriculum integration in the classroom, organizational support, or other factors leading to increased adoption of the initiative.

The current study may promote positive social change by allowing schools to understand their teachers' levels of technology acceptance and factors related to that acceptance. The study may provide the groundwork for school districts to adopt an effective technology plan to support their teachers. By incorporating the viewpoints of the primary teachers in the research, the current study may contribute to increasing technology initiatives in school districts. Decision makers may incorporate these results

to determine the needs of specific adopter groups to encourage adoption (see Grundmeyer & Peters, 2016; Holen et al., 2017; Scherer et al., 2019). Lastly, findings from this study may inform decisions concerning creating organizational and technical support, such as mentoring programs, which may promote technology acceptance.

Summary

This study involved nonexperimental research investigating the adoption of 1:1 technology by primary school teachers in suburban areas of New Jersey in the northeastern United States. Teachers' rate of adoption and potential relationships with organizational and technical support, as well as teachers' perceptions of the tool's usefulness and ease of use, were investigated using an online survey format. Technology's ubiquitous involvement in students' lives has resulted in its incorporation into learning objectives. Although educational decision makers have opted to invest in ways to provide 1:1 technology access to students, teachers have not taken advantage of the opportunity. Exploring potential factors impacting teachers' rates of adaption can help inform future efforts to promote technology acceptance in teachers to increase the integration of these tools into classroom pedagogies and curricula (Admiraal et al., 2017; Alizadehjamal & Keyhan, 2021; Ross, 2020; Solomon, 2017).

Technology is ubiquitous in the modern classroom. Teachers' perceptions affect their use of technology in the classroom because they make decisions to integrate 1:1 devices into their classrooms and lessons. Teachers' perceptions can be a factor in technology integration, influencing how teachers use technology in their classrooms (Khlaif, 2018; Lawrence et al., 2018; Tondeur et al., 2017*)*. Teachers who do not perceive

technology as easy to use and useful are less likely to integrate it into their classroom activities (Davis, 1989). Understanding teachers' perceptions may lead to supporting 1:1 device programs in primary schools by identifying a teacher's stage of adoption and putting an educational technology plan in place that helps provide teachers with technical and organizational support to increase a teacher's technology acceptance. Chapter 2 consists of a literature review that includes the theoretical framework, diffusion of innovation theory, and the TAM. This chapter also addresses the key concepts related to the study, such as technology in education, teachers' perceptions of technology integration, training teachers to use technology, 1:1 device programs, teacher technology training, and factors and barriers impacting instructional technology use.

Chapter 2: Literature Review

The problem this study addressed was whether the perceived usefulness, ease of use, organizational support, and technical support of primary teachers' technology acceptance of a 1:1 device program is related to their reported stage of adoption. The purpose of this quantitative study was to examine the relationship between New Jersey primary school teachers' technology acceptance of a 1:1 device program and their perceived usefulness, ease of use, organizational support, and technical support with their reported stage of adoption. Educational technology revolutionized education by permitting every student in the classroom access to a computer to further their knowledge and develop their skills as a part of their educational program. Scholarly research examined the appropriate role of computer-based technology as a teaching tool in the classroom and how teacher attitudes shape this role (Teo et al., 2018; Vongkulluksn et al., 2018; Xu & Zhu, 2020). Parrish and Sadera (2020) found that 1:1 device programs are a technology initiative designed to increase student access to educational technology. There is an increasing body of literature on 1:1 device initiatives (Bergström & Wiklund-Engblom, 2022; Gherardi, 2020; Khlaif & Salha, 2022; Peterson & Scharber, 2017; Yanguas, 2020). However, there was a need for further examination due to limited data, especially with teachers at the primary level (see Bergström & Wiklund-Engblom, 2022; Gherardi, 2020; Harper & Milman, 2016; Khlaif & Salha, 2022; Peterson & Scharber, 2017; Vongkulluksn et al., 2018; Xu & Zhu, 2020; Yanguas, 2020).

This chapter presents a review of relevant literature related to the issue of 1:1 device programs and the relationship between factors and teacher acceptance of the

technology. I also explain how the framework of diffusion of innovation and TAM was used to assess teachers' perceptions. Next, a literature review related to all key concepts is provided. The key concepts are technology in education, teachers' perceptions of technology integration, training teachers to use technology, 1:1 device programs, teacher technology training, and factors and barriers impacting instructional technology use.

Literature Search Strategy

Various scholarly and peer-reviewed journals and pertinent research articles were reviewed to identify studies for inclusion in this study. I conducted keyword searches using two primary databases: Educational Source and Educational Resources Information Center (ERIC). Additional databases included the Academic Search Complete, Dissertations & Theses, Dissertations & Theses at Walden University, Business Source Complete, Child Care and Early Education Research Connections, Chronicle of Higher Education, Computers and Applied Sciences Complete, PsycINFO, EBSCO, SocINDEX, and Education Research Complete Simultaneous Search, Education Commission of the States, Education Research Starters, IEEE Xplor Digital Library, ICT Statistics, LearnTechLib—The Learning and Technology Library, Library, Informational Science & Technology Abstracts, NTIS, SciDev.net, Scholar Works, Taylor, and Francis Online, Teacher Reference Center, ProQuest Central, SAGE Premier, SAGE, Information, Thoreau Multi-Database Search, Science & Technology Abstracts. Research Methods Online, and Walden Library Books. Google Scholar was also used to ensure current research in the study. These databases provided a wide range of coverage of journals in the field of education and educational technology.

The following key search terms were used: *laptop program* (312 articles), *laptop initiative* (141 articles), *teachers' attitudes about technology* (28 articles), *technology proficiency* (209 articles), *technology AND learning* (77,630 articles), *technology AND education* (118,347 articles), *teacher beliefs about technology* (76 articles), *adult education* (28,678 articles), *adult learning* (13,975 articles), *perceptions of 1:1 laptop* (five articles), *perceptions of 1:1 laptop programs* (zero articles), *laptops in education* (300 articles), *classroom use of technology* (1,523 articles), *technology implementation AND teachers* (738 articles), *educational technology integration* (258 articles), *technology pd* (58 articles), *technology professional development* (1,073 articles), *one to one technology AND technology acceptance* (438 articles), *one to one device AND teaching* (1,254 articles), *one to one device AND learning* (3,130 articles), *one to one device and school* (6,471 articles), *one to one device AND primary education OR elementary education OR primary school* (200 articles), *one to one technology AND technology acceptance model* (78 articles), *one to one AND technology acceptance AND teachers or teachers perceptions* (121 articles), *1:1 technology OR one-to-one technology OR one to one technology OR 1-1 technology* (148,114 articles), *technology acceptance model AND education* (58 articles), *1:1 technology OR one-to-one technology or one to one technology or 1-1 technology* (5,713 articles), *1:1 technology OR one-to-one technology OR one to one technology OR 1-1 technology AND technology acceptance model* (67 articles), *1:1 technology OR one-to-one technology OR one to one technology OR 1-1 technology AND teachers* (1,748 articles), *technology acceptance model (1,463 articles), technology acceptance model OR TAM* (2,883 articles), *1:1 technology and*

teachers perceptions (two articles), *1:1 technology OR one to one technology OR one-to-one technology AND teachers perceptions* (87 articles), *1:1 technology OR one to one technology OR one-to-one technology AND perceptions* (363 articles), *1:1 technology OR one to one technology OR one-to-one technology AND education* (3,647 articles), *COVID-19* (27,988 articles), *COVID19 AND education* (13,572 articles), *COVID-19 1:1 technology OR one to one technology OR one-to-one technology* (52 articles), *COVID-19 AND remote learning* (5,892 articles), *COVID-19 AND educational technology* (4,164 articles), *Chromebooks AND education* (923 articles), *Chromebooks AND elementary education* (11 articles), *laptops AND education* (16,580 articles), *laptops AND elementary education* (644 articles), *1:1 OR 1 "to" 1 OR one "to" one AND iPad AND technology acceptance* (19 articles), *1:1 OR 1 "to" 1 OR one "to" one AND Chromebook AND technology acceptance* (zero articles), *1:1 OR 1 "to" 1 OR one "to" one AND laptop AND technology acceptance* (42 articles), *1:1 OR 1 "to" 1 OR one "to" one AND standard* test* OR standard-based assessment AND elementary OR primary education* (6,792 articles), *1:1 OR 1 "to" 1 OR one "to" one AND chrome books* (453 articles), *1:1 OR 1 "to" 1 OR one "to" one AND laptops* (34,785 articles), *1:1 OR 1 "to" 1 OR one "to" one AND technology acceptance* (8,726 articles), *1:1 OR 1 "to" 1 OR one "to" one AND TAM* (32,039 articles), *1:1 OR 1 "to" 1 OR one "to" one AND technology acceptance model OR TAM* (34,165 articles), *Rogers diffusion of innovation* (2,197 articles), *Rogers diffusion of innovation AND education* (859 articles), *Rogers diffusion of innovation AND one to one technology* (13 articles), *Rogers diffusion of innovation AND perceptions* (347 articles), *Rogers diffusion of innovation AND perceptions OR attitudes*

OR opinion (691 articles), *Rogers diffusion of innovation AND teachers* (299 articles), *TAM OR technology acceptance model* (150,715 articles), *technology acceptance AND teachers* (3,175), *technology acceptance model AND teachers* (2,113 articles), *technology acceptance model AND teachers OR educators* (2,431 articles), *technology acceptance AND elementary OR primary education* (475 articles), *teacher perceptions AND elementary OR primary education* (16,740 articles), *teacher perceptions OR teacher attitudes OR teacher views AND elementary OR primary education* (54,303 articles), *teacher perceptions OR teacher attitudes OR teacher views AND elementary OR primary education AND technology acceptance* (81 articles), *teacher perceptions OR teacher attitudes OR teacher views AND elementary OR primary education AND technology acceptance model or TAM* (112 articles), *teacher perceptions OR teacher attitudes OR teacher views AND technology acceptance* (847 articles), *1:1 OR 1 "to" 1 OR one "to" one AND perceptions AND elementary OR primary education AND TAM OR technology acceptance* (40 articles), *1:1 technology OR one to one technology OR one-to-one technology AND student achievement OR academic achievement OR academic performance OR academic success or scholastic achievement* (908 articles), *1:1 technology OR one to one technology OR one-to-one technology AND student achievement OR academic achievement OR academic performance OR academic success OR scholastic achievement AND primary school OR elementary school OR primary education OR elementary education* (49 articles).

The scope of the literature supported the concept of perceptions and teachers' technological acceptance within schools. During the literature review, limiters were used

to filter the results, and the option for peer reviewed was selected to ensure quality research. There were limiters used for the years of publishing to be within the last 5 years, peer reviewed, full text, and published in academic journals. The research was developed through the use of specific references within the articles to build the literature review. Searches on one-to-one technology and education produced 3,081 results. Searches were narrowed with keywords to find the most appropriate articles. I reviewed each abstract to determine whether the research was pertinent to the study. Additionally, I identified specific literature using certain key terms (attitudes, beliefs, perceptions, outcomes, effects, and challenges), which would magnify the alignment of the research. Although there was a significant amount of research on teachers' perceptions, technology acceptance, and 1:1 technology at the postsecondary and high school levels, there was minimal research on how teachers' perceptions affect teachers' technology acceptance at the primary level.

Theoretical Framework

The framework for this study consisted of one theory and one model relevant to user acceptance and diffusion of technology innovations in primary school environments. The diffusion of innovations theory (Rogers, 2003) demonstrated how teachers fell into various adaptor categories, which predicted how they would respond to adopting innovations such as 1:1 devices. The technology acceptance model (Davis, 1989) supported the identification of teachers' perceived ease of use, perceived usefulness, and other factors to establish why the teacher would accept or reject using 1:1 devices in the classroom.

Diffusion of Innovations Theory

Rogers's (2003) theory of diffusion of innovations addresses how individuals adopt and use technology based on their experiences and reported adopter category. All innovations encounter a degree of resistance to their adoption (Rogers, 2003), and the effective adoption of an innovation, such as a 1:1 device program, is based on an adopter's willingness to accept change. Rogers stated that "the degree to which an innovation is perceived as better than the idea it supersedes can impact how fast technological innovation adoption will occur" (p. 15). The adoption of an innovation is then broken down into adopter categories to understand the process in which an innovation is adopted into a community.

Adopter Categories

Rogers (2003) added that the diffusion of innovation is measured by the time it takes the community to adopt the innovation, which can be determined by examining the adopter population. Adopters can fall into five categories based on how they adapt to innovation: innovators, early adaptors, early majority, late majority, and laggards. Rogers demonstrated that innovators are the first 2.5% of the people who adapt to innovation. The early adopters are the next 13.5% of people who adapt to innovation. The early majority adopters are the next 34% who adopt early into the innovation's lifespan. The late majority is considered the next 34% of people who adopt, and they are considered skeptical and will not adopt until they feel it is safe. The laggards are the last 16% of individuals who adapt to innovation because they are suspicious of change agents

(Rogers, 2003). Rogers classified individuals' adopter category by examining the timing of their response to innovation (see Figure 1).

Figure 1

Adopter Categories

Relationship between types of adopters classified by innovativeness and their location on the adoption curve.

Note. From Rogers, E. M. (2003). *Diffusion of innovations* (5th ed.). New York: Free Press.

Rogers's (2003) theory stipulates that when an innovation is available, individuals will respond to it with different levels of acceptance and enthusiasm. A person's interest and commitment can range from fully implementing the innovation to a complete rejection of the innovation (Foulger et al., 2013). The group identified as innovators will readily explore new ideas of an innovation, and the early adopters will decide to follow them (Rogers, 2003). Rogers's next two adopter categories of individuals who accept technology are the early majority and the late majority. The early and late majority acquire knowledge of the innovation through modeling and observation. The last of Rogers's adopter categories is the laggards. The laggards insist on asking questions and

gathering information on why they should not try the innovation. Laggards focus on an innovation's relative disadvantages and incompatibility with their values (Ribak & Rosenthal, 2015).

Innovation Attributes

Adopters' willingness to adopt an innovation can also be based on their perceptions of innovation attributes. Rogers (2003) defined five attributes of innovations that might be used by potential adopters to frame their perceptions of the innovations' value. These attributes are relative advantage, compatibility, complexity, trialability, and observability. Rogers explained that relative advantage is "the degree to which an innovation is perceived as better than the idea it supersedes" (p. 15), which impacts the speed at which innovations are adopted. Understanding the potential adopters' views, experiences, and values is essential. Perceptions of an innovation's complexity influence adoption rates. An adopter is inclined to embrace things with ease of use and that are useful to them, which can be tried before accepting (Rogers, 2003). In the current study, the relative advantage was explored in the research question addressing a teacher's perception of usefulness. If a teacher perceives the innovation of 1:1 devices as having a relative advantage because it is useful to them, they are more likely to adopt it into their classroom activities.

Compatibility, according to Rogers (2003), is "the degree to which an innovation is being perceived as being consistent with existing values, past experiences, and needs of potential adopters" (p.15). Compatibility comes in three forms: an innovation being incompatible with client needs for innovation, previously introduced ideas and values,

and beliefs. One way compatibility is understood is by the needs of an organization and adapters being introduced to the idea. Potential adaptors may not be aware of the innovation and may only realize they need it once it has been shared (Rogers, 2003). Rogers noted that most individuals do not evaluate innovations based on their performance but look at them from varying perspectives, including evaluations conveyed to them by others such as their peers. In the current study, compatibility was explored in the research question addressing organizational support. If teachers perceive the innovation of 1:1 devices as compatible with their values and beliefs and a part of their organizational needs being supported, they are more likely to adopt it into their classroom activities.

Complexity is another attribute of an innovation's adoption. Rogers (2003) noted that complexity is the "degree to which an innovation is perceived as difficult to understand and use" (p.16). Some innovations are adopted quickly into society, while the more complex ones are adopted more slowly as people perceive a need for them. Complexity is an essential factor for adoption because it can be considered a barrier if an innovation is not easy to use and understand. In the current study, complexity was explored in the research question addressing a teacher's perception of ease of use. If a teacher perceives the innovation as complex because it is not easy to use, they are more likely not to adopt it into their classroom activities.

Trialability is a fourth attribute relating to trying new ideas. Rogers (2003) explained that trialability is the "degree to which an innovation may be experimented with on a limited basis (Rogers, 2003, p.16). This is important when it comes to adopting

innovations because a person trying out an innovation and gaining experience with that innovation is a way to give it meaning. Trialability also becomes a factor when support is given for innovation. If a teacher is supported to get past this, a person trying the innovation who may have issues will be more successful and more likely to adopt it. This is not seen with early adopters but more with later adopters who are surrounded by peers who are using the innovation, which they view as a vicarious trial for the innovation. With this study, trialability is seen in the research question asking about a teacher's perception of technical support. If a teacher can use the innovation and find out how it works, it can dispel any uncertainty, making them more likely to adopt it into their classroom activities.

The last attribute is observability. Rogers (2003) states that observability is the "degree to which the results of an innovation are visible to others" (Rogers, 2003, p.16). With this factor, when an individual can easily see the results from an innovation such as 1:1 devices, they become more likely to adopt. This study shows observability in the research question asking about a teacher's perception of technical support. With coaching and support offered by the school, if a teacher can see the innovation being effective and see positive results from implementing the innovation in the classroom, they are more likely to adopt it into their classroom activities.

Rogers (2003) demonstrated an innovation's effectiveness as a vital factor in the adoption rate. The attributes are operationalized in this study through the factors of \organizational support and technical support. These attributes reflected in the factors of

each research question can help to predict 1:1 devices rate of adoption and impact a teachers' perceptions causing them to accept or reject 1:1 devices in the classroom.

Diffusion of Innovation in Prior Research

Examining prior research using Rogers (2003) diffusion of innovation provides insight into the acceptance and rejection of innovations within education. Chizwina and Mhakure (2018) found that teachers who had a negative opinion on adopting technology and felt that it was incompatible influenced their classroom use. In addition, if teachers did not find the technology easy to use, as they could not, for example, easily write an equation using a technological tool, they rejected the technology. They returned to the traditional means of 'pen and paper' (Chizwina & Mhakure, 2018). Using the diffusion of innovation framework, Chizwina and Mhakure also found a mismatch between beliefs and practices for mathematics teachers and their adoption of technology. They asserted, "this mismatch was evident in that, although some teachers believed that technology was critical, they also felt that the mathematics module for the bridging course was too basic to justify the use of technology" (Chizwina & Mhakure, 2018, p.9). This shows how teachers' perceptions and beliefs around technology and pedagogy strongly indicate they will adopt a technology.

Goh and Sigala (2020) discovered that it is vital to understand that an administrator cannot force all teachers to use technology. However, an administrator must pick out their innovators and early adaptors and assign these individuals as ambassadors, mentors, coaches, or given other administrative duties to support other teachers. Using this type of model, the administration provided technical support through

this mentoring system as well as building awareness and creating training workshops and trial opportunities to ensure teachers are knowledgeable about the new technology seeing its usefulness and ease of use to help increase the rate of adoption (Goh & Sigala, 2020).

Additionally, once teachers adopt the new technology, the administration must provide adequate technical support not only with mentoring and coaching but with the use of hardware and software to ensure that any issues and doubts that arise during the use of the new technology can be rectified preventing teachers' from lose confidence and therefore not adopting the new technology (Goh & Sigala, 2020). By understanding how usefulness, ease of use, and organizational and technical support can affect teachers' adoption of innovations in the classroom, we can use these factors to understand how primary teachers currently accept 1:1 devices.

Cirus and Simonova (2020) sought to understand how Rogers's diffusion of innovation applied to primary teachers. Their findings indicated that innovators, early adopters, and the early majority are relatively close to each other when adopting technology (Cirus & Simonova, 2020). The study also found that the late majority and laggards are very close in their perceptions of rejecting technology. Still, it was found that most of the teachers in this group were older and had more experience (Cirus & Simonova, 2020). It was also discovered that teachers' opinions, beliefs, and attitudes were essential in successfully implementing innovative technology in primary education. Understanding the research on primary educators and their intentions to adopt technology was essential in understanding how these behavioral intentions to adopt technology were reflected in the use of 1:1 devices in the classroom.

Technology Acceptance Model

The second part of the framework was the technology acceptance model (TAM). TAM examined reasoned actions based on perceptions of technology usefulness and ease of use (Davis, 1989). The TAM was developed using the psychology-based theory of reasoned action (TRA) and the theory of planned behavior (TPB) as its inspiration (Davis, 1989; Marangunic & Granic, 2015). The model was frequently used and has been employed in research studies since its inception (Henderson & Milman, 2020; Marangunic & Granic, 2015).

The TAM identifies the determinants of perceived ease of use (PEoU) and perceived usefulness (PU) to establish why technology users accept or reject a given technological innovation (Davis, 1989). PU is defined as the extent to which a person believes using technology will enhance their job performance. PEoU is defined as the degree to which a person believes that using a technology for a task will be free of effort (Henderson & Milman, 2020; Venkatesh & Bala, 2008). The TAM describes how these two constructs determine a person's behavioral intention to use devices. In the case of the study, the TAM will be used to determine the relationship between primary teachers' perceptions and their technology acceptance.

Additionally, the TAM has been deployed in educational settings as it generates 25 quantifiable variables to understand various attitudes toward technology acceptance (Henderson & Milman, 2020; Straub, 2009). Chintalapati and Daruri (2017) believed the TAM's popularity is due to its ability to address three essential elements of a theoretical model: parsimony, verifiability, and generalizability. These three factors can support

research in being transferable, replicable, and verify the data easily. The TAM can also be generalized to research investigating the acceptance and usage of new technologies. Due to these factors, the TAM is utilized in numerous studies across fields (Chintalapati & Daruri, 2017). Marangunic and Granic (2015) believed that the "technology acceptance model" has evolved to become the key model in understanding the predictors of human behavior toward potential acceptance or rejection of technology" (Marangunic & Granic, 2015, p. 92). By predicting teachers' behaviors, we can predict how likely they are to adopt new technology in the classroom.

TAM in Prior Research

An examination of prior research using the TAM demonstrates how 1:1 technology indicates a positive and highly significant relationship between "the effective use of mobile resources and the respondents' age" (Camilleri et al., 2017, p.46). Study findings implied a significant relationship between the PU of digital learning resources and the respondent's age and between PEoU and a respondent's gender. (Camilleri et al., 2017 p.46). Camilleri et al. (2017) explored how teachers "indicated that they were not extremely confident on how to use certain technologies in their lessons" (Camilleri et al., 2017, p.46). The results suggested that teachers may require their organization to provide technical support, professional development, and training to properly support technology integration in the classroom (Camilleri et al., 2017).

Scherer et al. (2019) findings on teachers' adoption of technology demonstrated the value of perceived usefulness, next to the perceived ease of use, as those factors significantly predicted a person's attitudes toward technology. In addition, this perception

of the usefulness of technology can be considered a critical factor in assessing the user's intention and ease of its use (Scherer et al., 2019). Henderson and Milman (2020) discussed how the TAM is important for both the teacher and the student because, for online learning, perceived ease of use and perceived usefulness are predictors (Henderson & Milman, 2020). Warschauer et al. (2014) noted that the positive effects of technology are related to many factors, including the type of technology used and the technological support offered. Also, their findings on the positive use of 1:1 devices need to consider digital literacy, appropriate teacher training, and social dynamics (Warschauer et al., 2014).

The TAM is generalizable (Scherer et al., 2019), which is vital for this study. The TAM offers guidance on the factors teachers use to improve technology use by looking at a particular technology, such as a 1:1 device program (Henderson & Milman, 2020; Scherer et al., 2019, 2020). All of this will help further understand factors that support 1:1 device adoption in classrooms.

Technology in Education

For the past three decades, technology has played a significant role in the classroom, and teachers have integrated technology to cultivate a positive learning atmosphere that embraces change (Scherer et al., 2019, 2020). There has been a steady increase in the integration of computers in schools since the 1990s (Zheng et al., 2016). Each year that passes, technology evolves and diffuses into society. The technology used for teaching evolves following the same diffusion of innovation patterns and spreads rapidly in education (Francom, 2020; Harper & Milman, 2016; Rogers, 2003).

Over the last decade, researchers have discovered that teachers' pedagogical beliefs are strong predictors of teacher use and acceptance of technology (Çoklar et al., 2017; Hallman, 2019; Xu & Zhu, 2020). As schools commit to providing access to educational technologies, a trend is seen toward a 1:1 device program. Institutions known as 1:1 schools have a one-to-one ratio of computers, laptops, or other technological devices to students (Curry et al., 2019). Each student is provided with an individual device and is responsible for this device and its use during the school day (Zheng et al., 2016). Although research exists examining 1:1 device program learning outcomes (Hallman, 2019; Harper & Milman, 2016; Parrish & Sadera, 2020). Currently, there is a gap in the literature examining the perceptions of primary-level teachers' technology acceptance of 1:1 device programs (Bergström & Wiklund-Engblom, 2022; Donovan & Green, 2010; Gherardi, 2020; Harper & Milman, 2016; Khlaif & Salha, 2022; Peterson & Scharber, 2017; Vongkulluksn et al., 2018; Xu & Zhu, 2020; Yanguas, 2020).

Current research illustrates that technology is an essential part of the educational setting. Technology can transform the learning environment to support student growth within the classroom (Bergström & Wiklund-Engblom, 2022; Francom, 2020; Henderson-Rosser & Sauers, 2017; Lawrence et al., 2018; Parrish & Sadera, 2020). Technology's growing role in education contributes to the ability of technology to individualize, differentiate work, and personalize learning based on the students' needs. Stakeholders promote innovative pedagogical practices by using technology (Gherardi, 2020; Parrish & Sadera, 2020; Peterson & Scharber, 2017). As a result, teachers must

respond to this new reality of technology-assisted learning and adapt their pedagogical practices and methodologies to support students' abilities, interests, and learning styles.

Research shows that technology can be an essential part of education in that it promotes innovative pedagogical practices (Danniels et al., 2020; Gherardi, 2020). Peterson and Scharber (2017) asserted in a case study the importance of integrating technology across the school and the factors that affect implementation. One factor is teacher leadership of early adopters to help with the roll-out of a 1:1 program, which is critical to its success, as well as supporting its teachers and ensuring there is reliable internet (Peterson & Scharber, 2017). Bergström and Wiklund-Engblom (2022) expanded on how the understanding of power struggles in 1:1 classrooms discovered the importance of teachers' ability to adapt to the technology and use 1:1 devices for higher-order goals is vital to address the needs of students (Bergström & Wiklund-Engblom, 2022). When considering the factors of integrating technology, such as support and training, it is critical to consider how these factors may cause teachers to adapt to 1:1 device programs and utilize them within the classroom.

1:1 Device Programs

1:1 device programs refer to initiatives in which teachers and students are provided their own devices to facilitate individual access to various technology-based resources for teaching and learning (Curry et al., 2019; De Melo et al., 2017; Harper & Milman, 2016). The increase in 1:1 programs across the United States is attributed to improved quality of education, improved academic achievement, increased equity, and providing economic advantage (Curry et al., 2019; Lawrence et al., 2018; Turkuresin,

2021). While some research on the 1:1 device program is unfavorable, it has led to positive outcomes in some schools (Curry et al., 2019; Danniels et al., 2020; Henderson-Rosser & Sauers, 2017). Due to the gains and positive outcomes, schools have continued to expand the 1:1 device program as researchers found that 1:1 device programs are designed to enhance a teacher's practice to improve educational outcomes within the classroom (Curry et al., 2019; Harper & Milman, 2016; Khlaif & Salha, 2022).

Recent studies related to the 1:1 device program indicate that a further understanding of teacher perceptions is an important factor used to improve and inform instructional practices (Curry et al., 2019; Gherardi, 2020; Khlaif & Salha, 2022; Lawrence et al., 2018). Gherardi (2020) explained how teachers and administrators have different perceptions of issues with 1:1 programs within schools, which causes issues in a successful implementation. For teachers, understanding the program goals and having support was critical. Holen et al. (2017) examined the implementation of a 1:1 device program in a rural high school. Data was collected through surveys from school stakeholders and interviews with 20 students at different grade levels. This study highlighted the positive outcome of the school's 1:1 device program. These positive outcomes occur when teachers utilize 1:1 technology to support student learning (Holen et al., 2017).

There has been a significant change in the role of the teacher with the use of 1:1 technology in the classroom. Research supports the preparation and training of teachers as essential for the meaningful integration of technology as it can impact teachers' perceptions (Curry et al., 2019; Li et al., 2019). This can affect teachers' attitudes and

perceptions of their technology efficacy (Zheng et al., 2016). Xu and Zhu (2020) indicated statistical significance in that teachers' acceptance and use of mobile technology in the classroom depended on their attitudes, beliefs, and self-efficacy with technology. While extensive research exists at the upper levels of education (Bergström & Wiklund-Engblom, 2022; Çoklar et al., 2017; Gherardi, 2020; Hallman, 2019; Khlaif & Salha, 2022; Li et al., 2019; Peterson & Scharber, 2017; Vongkulluksn et al., 2018; Xu & Zhu, 2020; Yanguas, 2020) there is still a need to understand primary teachers' perceptions towards 1:1 device programs.

Predictors of Educational Technology Use

Teacher perceptions and beliefs help shape technology use in the classroom. Research on 1:1 devices in classrooms shows that there are relationships between device usage in 1:1 environments and teacher attitudes and beliefs aligned with usage (Bergström & Wiklund-Engblom, 2022; Çoklar et al., 2017; Harper & Milman, 2016; Ross, 2020). Assessing teachers' perceptions of the use of technology in education allows researchers to discover that technology efficacy enabled changes in teachers' pedagogical beliefs (Tondeur et al., 2017). Teachers identified factors affecting technology integration, including the lack of time and control. Tondeur et al. (2017) explained how teachers employed in the same school do not always hold the same pedagogical beliefs (Tondeur et al., 2017). Li et al. (2019) explored the use of technology from the high school teacher's perspective based on their pedagogical beliefs, technology beliefs and attitudes, and teacher training. Consequently, this belief resulted in how technology integration impacted the classroom. Understanding teachers' perceptions is essential to

this study in order to properly understand the factors that cause teachers to accept or reject 1:1 devices in their classrooms.

Researchers discovered how teachers' attitudes toward technology could be a reliable predictor of how technology can be incorporated into classroom instruction (Francom, 2020; Li et al., 2019). Li et al. (2019) elaborated on how the teachers' self-efficacy is accompanied by their perceptions about how technology can serve as a significant predictor of how they will incorporate technology in the classroom (Li et al., 2019). Teachers' instructional approaches, openness toward technology, and perceived training effectiveness were also predictors of their use of technology to support classroom technology integration (Li et al., 2019).

Seif and Biranvand (2019) also discussed how teachers' technical knowledge and technological pedagogical knowledge influence their self-efficacy. Seif and Biranvand (2019) discovered that building teachers' technological efficacy within a training structure would enhance their ability to use technology in the classroom. Using training will allow focus on the abilities and capabilities of teachers with support tailored to their needs. This type of support has shown that teachers will have a higher technology acceptance and, therefore, be more likely to use 1:1 technology in the classroom. Seif and Biranvand suggested that educational leaders must train and support teachers to support teacher beliefs in technology integration and motivate and build their interest in using technology in the classroom. This belief follows Hallman's (2019) research, where he conducted a case study of a new teacher and how teachers will need to be accepting of technology initiatives within the classroom structure and be able to adapt to the changing

role of the teacher and the student. The goal of incorporating technology within the classroom is to allow the teacher to facilitate lessons digitally and by allowing them the freedom to choose how they will navigate technology, making concrete decisions on how it will be integrated into their classroom instruction (Hallman, 2019).

Changes in teachers' attitudes must also be considered when looking at factors that can contribute to a teacher's technology acceptance and their stage of adoption of 1:1 technology in the classroom. Philipsen et al. (2019) and Philipsen et al. (2022) discussed how professional development opportunities empower teachers, and they found a statistically significant increase in teachers' self-efficacy as well as their ability to use technology in the classroom environment. Using professional development as a means of increasing a teacher's technological abilities, it is more likely that teachers will integrate these technologies into the classroom curriculum.

There are many complexities associated with pedagogical beliefs and technology integration; for example, Philipsen et al. (2022) and Vongkulluksn et al. (2018) asserted that school support, such as technology resources, organizational support, administrative support, and school culture around technology integration, had a statistically significant effect on teachers' beliefs. These beliefs, in turn, affected technology integration into classroom activities. Vongkulluksn et al. found that when teachers felt that the technology added value and was considered a value belief, they were more likely to integrate it into classroom activities. Similarly, Cheng et al. (2021) added that beliefs around technology integration have complex relationships with how a teacher will integrate it into the classroom. Teachers' beliefs did not simply predict technology

implementation, but it was found that teachers' beliefs are highly intertwined and interact with their integration. The more competent a teacher is with technology, the more likely they would integrate it into the classroom (Cheng et al., 2021). This study will investigate the relationships between these beliefs and how they affect the adoption of 1:1 technology in the classroom.

Training Teachers to Use Technology

As teaching with technology continues to become an integral part of the educational landscape, several researchers highlighted the need for further examination to determine the benefits and how to achieve the benefits of using technology for teaching and learning (Harper & Milman, 2016; Peterson & Scharber, 2017; Scherer et al., 2019, 2020; Steed & Leech, 2021). Many studies were conducted on how technology impacts learning environments without incorporating teachers' perspectives as adult learners (Harper & Milman, 2016). Teacher training in technology is not a new venture. Teachers who received technology training continue to use technology because they become comfortable integrating it into the classroom (Peterson & Scharber, 2017; Sanchez-Prieto et al., 2019). The changes in technology contribute to the justification to find innovative strategies to incorporate into the classroom to enhance learning (Krutka et al., 2016; Lawrence et al., 2018). There is a growing push to prepare teachers to use technology to enhance student learning because educational technology is viewed to enable teaching and learning to enhance student's educational experience (International Society for Technology in Education, 2019a, 2019b, 2019c; Sanchez-Prieto et al., 2019). Properly preparing teachers is essential to support 1:1 use in the classroom.

Continuing the support of technology training to prepare teachers for implementing technology will promote learning and development significantly (Alizadehjamal & Keyhan, 2021; Liao et al., 2017; Parrish & Sadera, 2020; Peterson & Scharber, 2017; Sanchez-Prieto et al., 2019). Teachers who engage in professional growth programs or teacher training will enhance their classroom learning compared to teachers who do not participate in this level of learning (R. Christensen & Knezek, 2017; Sanchez-Prieto et al., 2019). Since teachers have individual training needs, Liao et al. (2017) noted that for teacher training to be practical, incorporating appropriate content and adopting an accessible mode of delivery that fits teachers is crucial.

To implement technology in the classroom, a focus on developing teachers' skills will be necessary. Developing teachers' skills using professional development and technical support will help them accept new technologies by increasing a teacher's understanding of how to utilize the technology in the classroom, which will build on teachers finding the technology useful and easy to use (Scherer et al., 2019, 2020; Steed & Leech, 2021). Teachers are viewed as the predictor of successful technology implementation (Harper & Milman, 2016; Holen et al., 2017; Lawrence et al., 2018). Their acceptance and use of technology allow them to create pedagogical change (Gherardi, 2020; Lawrence et al., 2018).

Steed and Leech (2021) found a significant difference in the technology acceptance between those teachers who received professional development and support (Steed & Leech, 2021). However, as technology programs increase in schools, organizational support for teacher preparation and professional development is

challenged to adapt to the rapid rate of change and the adoption of new technologies (Grundmeyer & Peters, 2016). O'Neal et al. (2017) examined teacher beliefs about the role of technology in the classrooms, and teachers expressed a need for additional guidance and support as integrating technology proved challenging (O'Neal et al., 2017). Additionally, it was revealed that teachers consider technology an enabler of teaching and learning; they need support to feel better prepared to integrate technology (O'Neal et al., 2017). Other factors that may influence how teachers use technology include time for professional development, ease of use, access to technology, support for technology, and attitude toward technology (see Davis, 1989; Grundmeyer & Peters, 2016; Marangunic & Granic, 2015; O'Neal et al., 2017; Scherer et al., 2019, 2020; Steed & Leech, 2021). Teachers could feel unprepared to integrate technology in the classroom, which contributes to their beliefs and technology integration.

Teachers are viewed as the predictor of successful technology implementation because their acceptance and use of technology allow them to create pedagogical change (Harper & Milman, 2016). However, as technology programs increase in schools, organizational support of teacher preparation and professional development are challenged to adapt to the rapid rate of change and adoption of new technologies (Grundmeyer & Peters, 2016; Philipsen et al., 2022).

Consequently, gaining an understanding of teachers' experiences through more profound insights into their perceptions of the issues and challenges to develop technical competency is needed to prepare better teachers to use technology for successful educational reform and find its influence on teaching (Ditzler et al., 2016; Harper &

Milman, 2016; Lawrence et al., 2018; Scherer et al., 2019, 2020; Seif & Biranvand, 2019; Steed & Leech, 2021). This study will provide information on how to understand these challenges and properly support teachers in their use of 1:1 devices for classroom activities.

Factors Impacting Instructional Technology Use

Implementation of 1:1 device programs has been growing, especially recently due to the COVID-19 pandemic shutdown (McKenna et al., 2021; Schalk et al., 2022). Many schools had pivoted to online learning, where students learned from home with a device during school closures. Research dedicated to online learning and embedded digital curricula has been ongoing, but due to the pandemic, this pivot to online learning was unexpected, quick, and challenging (McKenna et al., 2021; Schalk et al., 2022). There is minimal research on the full effect of the COVID-19 pandemic and its impact on education, the use of 1:1 devices for remote learning, and the successes and barriers to this type of learning (McKenna et al., 2021; Safi et al., 2020; Schalk et al., 2022).

Steed and Leech, 2021 found that teachers had to spend more time planning than working with students. There was a significant difference between those teachers who received professional development and support compared to those who did not (Steed & Leech, 2021). Schalk et al. (2022) expressed that the long-term impact and implications of this pivot to online learning are still unknown, which caused a significant change in practice for educators and students (Schalk et al., 2022). McKenna et al., (2021) explored the impact on early childhood educators' practices, successes, and barriers with remote instruction during the COVID-19 pandemic. McKenna et al. asserted that teachers could

successfully pivot during the pandemic and adapt remote instruction. Over time, teachers' levels of confidence increased. McKenna et al. noted that teachers would need additional support to improve their access to technology, reliable internet, communication, guidelines, expectations, and support. Due to the above factors, teachers' perceptions of using 1:1 devices in the classroom may have been impacted by their experiences living and teaching during the COVID-19 pandemic.

Further examination of the different types of factors affecting use can yield more information. Extrinsic factors are noted as first-order barriers that include access to technology, professional development, and technology support. In contrast, intrinsic or second-order barriers can consist of teachers' pedagogical beliefs, perceptions of technology's value, and confidence in technology use (Durff & Carter, 2019). External factors such as professional development and administrative and financial support are hypothesized to positively influence the perceived benefits of technology integration, technology use, and efficacy for technology integration (Francom, 2020; Tondeur et al., 2017). By studying these factors and looking at how they impact technology use, administrators can better understand how to support teachers by offering organizational and technological support.

There is a wide variety of factors that affect teachers' acceptance of technology. Barriers to teacher technology stem from a lack of confidence, competence, resources, and pedagogical design for effective technology use (Durff & Carter, 2019; Francom, 2020). Teachers' pedagogical beliefs might hinder or prevent technology integration and impact instructional technology use in the classroom (Durff & Carter, 2019; Francom,

2020; Tondeur et al., 2017). However, Goodwin et al. (2015) expanded on how internal and external factors related to instructional technology can influence teachers to utilize technology more and barriers to use. Goodwin et al. noted that external factors include inadequate technology access, time, training, and support. The internal factors were attitudes, beliefs, and competence (Francom, 2020; Goodwin et al., 2015). Factors affecting technology integration have made it difficult for teachers to integrate technology into classroom activities. Francom (2020) noted that 60% of teachers felt that time was the most significant factor, followed by training and technical support at 37.6% and 35.9%, respectively. Administrative support followed with 33.3% agreement, and teacher beliefs were the least significant, with 15.6% agreement for this study (Francom, 2020). It is essential to mitigate these barriers to improve technology acceptance of 1:1 in schools.

Access to instructional technology tools was a common factor affecting the use of technology in the classroom. A teacher's decision to use or not use technology in the classroom is mainly influenced by access to resources. Another factor is the quality of software and hardware, its usefulness, and ease of use. Also, incentives to change and a commitment to professional learning are factors (Francom, 2020; Kihoza et al., 2016). When teachers experienced the frustration of a lack of access to the computer or an unsustainable power supply, they were found to be less likely to implement technology for instruction (Francom, 2020; Kihoza et al., 2016). Ross (2020) explained that it is essential to have technical support available so that instruction is not interrupted due to many issues, such as equipment, software, and internet problems (Ross, 2020). These

studies indicate a need to continue researching teachers' perceptions to build an understanding of factors to improve their technology acceptance.

Many factors continue to exist even with the ever-evolving environment of technology in education; perceived ease of use and perceived usefulness come from having resources such as training to support teachers' knowledge and skills that help to change their attitudes and beliefs. Lack of resources was classified as the most important factor, including a lack of technology, technological access, time, and technical support. Teachers need adequate technical support to use and learn different technologies. Having limited organizational or a limited number of technical support personnel in a school hinders teachers' technology use (Top et al., 2021). Teacher training is another factor that can change a teacher's perception and adoption of technology (Top et al., 2021). Training for in-service teachers has been generally provided as one-shot sessions that do not come with ongoing support in teaching environments or accommodating integration experience in teachers' own context (Erdem, 2020). This study will use organizational and technological factors such as administration support and teacher training to understand teachers' perceptions and technology acceptance.

Factors exist that affect the acceptance of technology. The three significant factors are as follows: access to technology, teacher technology proficiency, and teacher perceptions and attitudes toward the use and value of technology, which can exclude teachers from integrating technology in the classroom (Francom, 2020; Tondeur et al., 2017). The researchers explained how noted barriers fall within the research of Rogers (2003) theory of diffusion of innovations as well as the TAM. This study will investigate

the relationship between primary teachers' reported stage of adoption and perceived usefulness, perceived ease of use, perceived organizational support, and perceived technological support in a 1:1 device program to show how these potential factors affect technology acceptance.

Summary

The benefit of 1:1 device programs as an instructional tool provides increased student engagement, supports technological literacy, and higher levels of peer-to-peer collaboration (Ditzler et al., 2016; Grundmeyer & Peters, 2016; Henderson-Rosser & Sauers, 2017; Holen et al., 2017; O'Neal et al., 2017). The perceptions of teachers using 1:1 devices are the key to creating a successful initiative within primary schools. This research study demonstrated the potential to reveal organizational factors that are needed to understand primary teachers' use, acceptance, and adoption of 1:1 instructional technology in their classrooms. Incorporating 1:1 technology use into classroom activities employs constructivist practices that have been determined beneficial to learners. Some vital elements of teachers' decision to adopt or reject a technological innovation are expressed through the tenets of the TAM: PEoU and PU.

While the literature review provided helpful information on teachers' perceptions and adoption of 1:1 device programs in the classroom, only a few studies examined the topic through the lens of primary teachers. Furthermore, while many studies focused on 1:1 device programs, there were no studies related to the perceptions and technology acceptance of primary teachers in a 1:1 teacher device program. The review of the literature provided insights and justified the use of quantitative research to examine

teachers' perceptions. By grounding this study through the literature, this study may provide a unique perspective to understand the perceptions and experiences of primary teachers who use 1:1 device programs.

The goal of the study was to provide insight for school leaders on teacher demographics that lead to increased technology acceptance and widespread adoption of 1:1 technology in the classroom. The study aimed to provide insight into teachers' perceptions of needing support for a successful 1:1 program implementation. This research study's investigation of primary teachers' reported levels of 1:1 technology adoption concerning these various factors was limited due to potential biases.

In the next chapter, the researcher examined the research method while looking at the ordinal logistic regression research design and the rationale. The researcher reviewed the methodology, the population of this study, how teachers were recruited and obtained a sample. Then, the instrumentation will be explained along with its evaluation. Also, the four research questions and issues of trustworthiness and credibility are addressed.

Chapter 3: Research Method

The purpose of this quantitative study was to examine the relationship between New Jersey primary school teachers' technology acceptance of a 1:1 device program and their perceived usefulness, ease of use, organizational support, and technical support with their reported stage of adoption. This chapter outlines and justifies the selection of the quantitative approach and the rationale for the nonexperimental study design. The chapter addresses the sample population and how participants were recruited. I also explain the deployment of an online survey instrument to obtain the data. This chapter includes the rationale for selecting the targeted population and the details of the data collection method. The chapter concludes with the plan for data analysis, ethical concerns, issues of trustworthiness and validity, and a summary.

Research Design and Rationale

I used an ordinal logistic regression to examine whether New Jersey primary school teachers' stage of adoption is predicted by their perceived ease of use, usefulness, organizational support, and technical support and how these factors relate to teachers' technology acceptance of 1:1 devices through their reported stage of adoption of technology in classroom activities. Solomon (2017) used a correlational analysis to examine high school teachers' perceptions about the incorporation of 1:1 technology into classroom activities. In the current study, an ordinal logistic regression design was used to examine whether a teacher's stage of adoption is predicted by perceived ease of use, usefulness, organizational support, and technical support. The nonparametric design was selected due to the single-item, forced-choice measure of the stage of adoption instrument

combined with my inability to manipulate the independent variables (i.e., perceived ease of use, perceived usefulness, perceived organizational support, and perceived technical support).

The nonexperimental quantitative design supported the research questions by examining the relationship between the teacher's perceived usefulness, perceived ease of use, perceived organizational support, and perceived technical support and the teachers' stage of adoption of technology. There were no time constraints that affected the choice of the design. An online survey was selected because participants could fill it out at their convenience, and there were no time or resource constraints. The study's resource restraints depended on the population and whether teachers elected to participate. The design choice of an ordinal logistic regression was consistent with research designs for quantitative studies examining the relationship between variables (Laerd Statistics, 2015). The ordinal logistic regression design was the most appropriate method for the current study because it provided an understanding of the degree and direction of the relationship between variables of interest (see Creswell, 2014). The quantitative approach provided the study with nonbiased statistical data to examine the relationship between the variables of interest (see Rogers, 2003). This study may provide new insight into how these factors are related to technology acceptance of 1:1 devices in primary school classrooms in New Jersey.

Methodology

Population

Creswell (2014) explained that the population of the study needs to be "individuals who are accessible, willing to provide information, and [who are able to] shed light on [the] specific phenomenon" (p. 147). The selection process was determined by the suburban area where teachers have used 1:1 technology for teaching without it being an entirely new phenomenon. The target population of this study included current primary teachers in New Jersey. For the purposes of this study, primary teachers were defined as teachers of kindergarten through eighth grade. The population size was 129,689 primary school teachers. Teachers participating in the survey used or had the opportunity to use 1:1 technology for classroom instruction in primary education.

Sampling and Sampling Procedures

Type of Sampling

Primary schools in New Jersey provided an accessible population due to a large number of primary educators (see Gliner et al., 2009), which allowed me to collect data from individuals willing to participate in the study. Creswell (2014) suggested that using an accessible population to collect data will "purposefully inform an understanding of the research problem" (p. 156). The Likert-style survey tool was digitally deployed and shared with primary teachers. Teacher email addresses were obtained through publicly available websites. The survey was sent to teachers via their school email with an online link. All primary educators in New Jersey who chose to complete the survey were participants in the study if they met the requirements. This type of sample was purposeful

and constituted a convenience sampling approach (see Stratton, 2021). To the extent that teachers told other teachers about the survey, there was a snowball sampling effect in my sampling strategy as well (see Stratton, 2021).

Sample Size

A power analysis was conducted using G*Power, the bivariate normal model, to determine the ideal sample size. Kang (2021) reported that to have an accurate power analysis calculation for a sample size estimate, the G*Power software should be used to find the ideal sample size. In addition, Kang explained that the purpose of power analysis is to conduct a priori analyses to control for Type I and Type II errors and is "the ideal method of sample size and power calculation" (p. 3). Cohen (1992) explained that .03 is a medium effect size, that a typical hypothesis should be for a two-tailed test, and that an error probability should be set to the .05 level. The desired power should be set to .80. Using these parameters, I conducted a power analysis that resulted in a minimum sample size of 84 teachers employed at various primary schools in New Jersey (see Appendix A). To ensure the appropriate number of responses was obtained, I deployed a minimum of 900 surveys across primary schools in New Jersey.

Procedures For Recruitment

I applied to Walden University Institutional Review Board (IRB) for approval. Once IRB approval was obtained (09-05-23-0664183), I contacted New Jersey teachers through their work emails. I sent an email with the informed consent describing the study with a link to the survey. If a teacher was interested in participating in the study, they clicked on the link in the email, effectively giving their consent to participate. If a

participant chose not to participate, they clicked “I do not consent,” deleted the email, or took no action. At any time, the participant was able to exit the survey if they changed their mind about participating.

Because the first procedure did not generate enough participants, a second plan was used to gain participants by using Facebook groups representing personal learning networks. I contacted the New Jersey Teacher Association’s social media pages and acquired permission to post my recruitment flyer. On Facebook, there are many New Jersey education-related groups. I wrote to the group administrators to obtain permission to share an infographic and post for recruitment to the study (see Appendix G). Once I received permission, an infographic and a recruitment post (see Appendix H) were shared several times within these groups, including relevant hashtags. If more participants were needed after these two procedures were followed, the third plan for recruitment was to use social media hashtags to share the study across all social media platforms. By using these hashtags, it was possible to reach educators who may have been interested in participating in the survey and met the inclusion criteria. Using hashtags was a public way to share information on a broad scale. Using these methods as needed, I was able to recruit a minimum of 84 New Jersey primary school teachers.

Potential participants from social media were directed to use the study link that was part of the social media recruitment post. The participants were given the option to contact me via email if they were interested in participating in the study. Once contact was initiated, potential participants were sent a reply email with a link to the survey and a remainder of the process. After completing the survey, the participants clicked submit,

and their participation was considered complete, with answers recorded. There was no follow-up with participants.

Instrumentation

I collected quantitative data for an ordinal logistic regression analysis using two survey instruments combined into one. Due to 1:1 technology integration in classroom activities being relatively new and the lack of an existing measurement instrument that would address the research questions following the TAM, I used two instruments to collect data that addressed the research questions related to the TAM. The corresponding authors of these instruments were contacted, and permission was given to use both instruments in my study (see Appendix B). The two instruments included the Stages of Adoption (SA; R. Christensen, 1997) and the Freedom to Learn-Teacher Technology Questionnaire (FTL-TTQ) (Lowther et al., 2000; see Appendix C).

SA Instrument Validity and Reliability

The SA is a single-item, forced-choice instrument that reflects the respondent's level of technology adoption based on one of six responses. Each response corresponds to a level of technology adoption from 1 (lowest level of adoption) to 6 (highest level of adoption). The six levels of adoption, from lowest to highest, are Stage 1 Awareness, Stage 2 Learning the Process, Stage 3 Understanding and Application, Stage 4 Familiarity and Confidence, Stage 5 Adaptation to Other Contexts, and Stage 6 Creative Application to New Contexts. The instrument takes less than 5 minutes to complete, making it an efficient one-time reporting process with many applications in education (R. Christensen, 1997). According to Hancock et al., (2007), the instrument is a single-item

survey, internal consistency of reliability measures cannot be calculated for data gathered through it. However, a high test-retest reliability estimate (.91) was obtained from a sample of 525 K–12 teachers from a metropolitan North Texas public school district during August 1999. (Hancock et al., 2007). In terms of evidence of content validity, R. Christensen et al. (2001) observed that technology integration was accurately predicted by teachers' self-reported SA scores when looking at the teachers' will, technology skill, access to technology tools, and higher classroom technology integration as measured by and compared with an instrument that measures similar constructs: the Concerns-Based Adoption Model Levels of Use scale. The SA is used to collect pertinent demographic information from teachers and to generalize descriptions of each stage of technology adoption to make the statements appropriate for any information technology (R. Christensen, 1997). During the validation phase of the SA, the survey was administered to 621 educators (R. Christensen, 1997).

FTL-TTQ Validity and Reliability

This questionnaire has been frequently used in studies to understand teachers' perceptions of technology regarding five areas: (a) impact of classroom instruction, (b) impact on students, (c) teacher readiness to integrate technology, (d) overall school support for technology, and (e) technical support (Inan & Lowther, 2010a; Lowther et al., 2008). The minimum number of Likert scale responses recommended by Allen and Seaman (2007) is five, which is the minimum used in the FTL-TTQ instrument. The responses range from 1 (*strongly disagree*) to 5 (*strongly agree*; Inan & Lowther, 2010b).

The reliability of the FTL-TTQ was determined by the Center for Research in Educational Policy, with reliability coefficients ranging from .75 to .89 for each subscale of the instrument (Inan & Lowther, 2010a). The FTL-TTQ is copyrighted by the Center for Research in Educational Policy, from whom I obtained permission to use the instrument in my study. Inan and Lowther (2010a) explained that the reliability of the instrument was based on responses from 4,863 teacher participants. The FTL-TTQ was designed and validated to collect teachers' perceptions of computers and technology integration (Lowther et al., 2000).

Evaluation of Instrument for This Study

The current study included an electronic version of both surveys (see Appendix D) using Google Forms, which was distributed through email to primary teachers in New Jersey. Creswell (2009) identified a survey as an appropriate means to quantify or numerically describe a sample population's trends, attitudes, perceptions, or opinions. Cook and Cook (2008) noted that surveys can be used as an appropriate method to measure a phenomenon that cannot be observed directly. Surveys are also used to generalize inferences about a characteristic, behavior, or attitude from a sample to a population (Creswell, 2009; Henderson & Milman, 2020).

The current study addressed the perceptions of primary teachers and their level of technology acceptance. I could not capture the concept of perception and technology acceptance from a relatively large number of participants; however, a survey instrument could (see Cook & Cook, 2008). A survey was the best way for teachers to self-report their perceived ease of use, usefulness, organization support, and technical support. Cook

and Cook (2008) explained that surveys are instrumental in understanding how a group may perceive using 1:1 devices in the classroom. Surveys allow for a snapshot of the information in the representative population.

Although 1:1 devices in the classroom have been studied, there was no current tool to measure teachers' perceptions and adaptation to classroom activities related to the TAM. A combination of the two published survey tools, minimally modified to address my research questions adequately, is provided in Appendix D. The two tools were R. Christensen's (1997) SA survey and Lowther et al.'s (2000) FTL-TTQ. I adjusted the wording of the survey questions to address 1:1 technology integration into classroom activities using the online survey instrument that was disseminated to primary school educators, and my research committee verified the face validity of the changes.

With committee approval, I modified the questions to investigate teachers' self-reported stage of adoption of 1:1 technology integration into classroom activities. Several variables were involved in this study, and the Likert-style responses allowed further examination. The items in the FTL-TTQ addressed each research question by reviewing perceived ease of use, perceived usefulness, perceived organizational support, and perceived technical support and how these factors relate to a teacher's stage of adoption. Participants completed the survey using both tools to provide demographic information, self-reported stage of adoption, and perceptions of factors that affect their technology acceptance.

Each question fell into one of the four categories in the survey. The answers to questions one through four demonstrated the relationship between the variables of

perceived ease of use, perceived usefulness, perceived organizational support, and perceived technical support and the level of teachers' technology adoption of 1:1 activities in the classroom.

Table 1 below depicts the survey questions to align the constructs found in the original instruments: the Stages of Adoption (SA) Survey (R. Christensen, 1997) and the Freedom to Learn-Teacher Technology Questionnaire (FTL-TTQ) (Lowther et al., 2010). As per Laerd Statistics (2015), an acceptable method for handling this violation is to run a binomial regression (Laerd Statistics, 2015). The mean was calculated from participant responses to find the relationship between teachers' perceptions and the factors that affect their adoption of technology in the classroom. Mean responses to research questions one through four were used to test the relationship between a teacher's stage of adoption of 1:1 devices in the classroom and factors that can affect adoption.

Table 1

Alignment of Instruments to Variables of the Study

Instrument name/variable	Scale type	Minimum score	Maximum score
Stages of technology adoption	Ordinal (single question, forced choice)	1 (technology least adopted)	6 (technology most adopted)
FTL-TTQ: Usefulness	Ordinal 5-point Likert measures on items 17a, 17b, 17c, 17d, & 22a	5 (least perceived usefulness)	25 (most perceived usefulness)
FTL-TTQ: Ease of use	Ordinal based on 5-point Likert measures 19a, 19b, 19c, 19d, & 22b	5 (least perceived ease of use)	25 (most perceived ease of use)
FTL-TTQ: Organizational support	Ordinal based on 5-point Likert measures 20a, 20b, 20c, 20d, & 20e	5 (least perceived amount of organizational support)	25 (most perceived amount of organizational support)
FTL-TTQ: Technical support	Ordinal based on 5-point Likert measures 21a, 21b, 21c, 21d, 23a, 23b, 23c, & 23d	5 (least perceived amount of technical support)	25 (most perceived amount of technical support)

Note. FTL-TTQ = the Freedom to Learn-Teacher Technology Questionnaire. The alphanumeric identifiers under Scale Type indicate the item numbers used to calculate the respective scales (see Appendix D).

In question 1, the responses determined if there is a relationship between teachers' reported perceptions of the usefulness of a 1:1 device program and their Stage of adoption. The stage of adoption was noted by a teacher's selection of their adopter category; one of six statements is chosen in question 16 of the survey, creating an ordinal data selection. This will be compared with the means of questions 17a, 17b, 17c, 17d, and 22a, which will provide the perceived usefulness. In question 2, the responses determined

if there is a relationship between teachers' reported 1:1 device programs' perceived ease of use and their stage of adoption. The stage of adoption was noted by a teacher's selection of their adopter category in question 16 of the survey. This will be compared with the means of questions 19a, 19b, 19c, 19d, and 22b, which provided the perceived ease of use. In question 3, the responses will determine if there was a relationship between teachers' reported perceived organizational support of a 1:1 device program and their stage of adoption. The stage of adoption was noted by a teacher's selection of their adopter category in question 16 of the survey. This was compared with the means of questions 20a, 20b, 20c, 20d, and 20e, which provided the perceived organizational support. In question 4, the responses determined if there is a relationship between teachers' reported perceived technical support of a 1:1 device program and their stage of adoption. The stage of adoption was noted by a teacher's selection of their adopter category in question 16 of the survey. This was compared with the means of questions 21a, 21b, 21c, 21d, 23a, 23b, 23c, and 23d, providing the perceived technical support.

Data Analysis Plan

The purpose of this nonexperimental quantitative research study was to examine the relationship between New Jersey primary school teachers' perceived usefulness, perceived ease of use, perceived organizational support, and perceived technical support and how these factors relate to teachers' technology acceptance of 1:1 devices through their reported stage of adoption of technology in classroom activities.

The software used to conduct the data analysis was the Statistical Package for the Social Sciences (SPSS) version 27.0. The data was screened by running a frequency

analysis to look for missing data, and all missing data was not used to ensure the statistical assumptions were met. Using that process, data was verified as accurate before entering it into SPSS. For this quantitative study, an ordinal logistical regression was utilized to look for statistically significant relationships as outlined by the following research questions.

RQ1: What is the relationship between teachers' self-reported perceptions of 1:1 device programs' usefulness and their stage of adoption?

$H_0$1: There is no significant relationship between teachers' self-reported perceptions of 1:1 device programs' usefulness and their stage of adoption.

H_a1: There is a significant relationship between teachers' self-reported perceptions of 1:1 device programs' usefulness and their stage of adoption.

RQ2: What is the relationship between teachers' self-reported perceptions of 1:1 device programs' ease of use and their stage of adoption?

$H_0$2: There is no significant relationship between teachers' self-reported perceptions of 1:1 device programs' ease of use and their stage of adoption.

H_a2: There is a significant relationship between teachers' self-reported perceptions of 1:1 device programs' ease of use and their stage of adoption.

RQ3: What is the relationship between teachers' self-reported perceptions of organizational support of 1:1 device programs and their stage of adoption?

$H_0$3: There is no significant relationship between teachers' self-reported perceptions of organizational support of 1:1 device programs and their stage of adoption.

H_a3: There is no significant relationship between teachers' self-reported perceptions of organizational support of 1:1 device programs and their stage of adoption.

RQ4: What is the relationship between teachers' self-reported perceptions of technical support of 1:1 device programs and their stage of adoption?

$H_0 4$: There is no significant relationship between teachers' self-reported perceptions of technical support of 1:1 device programs and their stage of adoption.

$H_a 4$: There is a significant relationship between teachers' self-reported perceptions of technical support of 1:1 device programs and their stage of adoption.

The non-experimental quantitative research design supported the research questions by examining relationships between FTL-TTQ perceptions of 1:1 technology integration and the SA measure of stages of adoption. The effect of the variables were analyzed non-parametrically using an Ordinal Logistic Regression to the single-item, forced-choice measure of the SA instrument.

For RQ1, I examined how teachers' FTL-TTQ reported the perceived usefulness of a 1:1 laptop program related to their level of adoption. For RQ2, I examined how teachers' FTL-TTQ reported perceived ease of use of a 1:1 laptop program related to their SA-measured level of adoption. For RQ3, I examined how teachers' FTL-TTQ reported perceived organizational support for the 1:1 laptop program related to their SA-measured level of adoption. For RQ4, I examined how teachers' FTL-TTQ reported

perceived technical support for the 1:1 laptop program related to their SA-measured level of adoption. To correctly interpret the data for the study, the significance level will be set at.05, and the confidence interval set at 95% for each test. This ensured that the data gained from the tool would accurately describe positive and negative relationships between the variables of interest for each research question.

Threats to Validity

External threats to validity make generalization of the findings difficult for the larger population (Babbie, 2017), which was the rationale for selecting a one-time survey for this research. Internal threats to validity prevent the researcher from using and trusting the results due to factors such as history, maturation, experimental mortality, statistical regression, or any factor other than the tested variables (Babbie, 2017). Both external and internal threats to validity are addressed during the study, as described below.

Addressing threats increases the validity and trustworthiness of the collected data (Babbie, 2017). Internal and external threats to validity are not typically associated with survey research but rather when conducting pre-experimental, experimental, quasi-experimental, and ex post facto research (Ary et al., 2019). When conducting a one-time survey study, there were no external threats to validity due to factors such as testing reactivity, interaction effects, reactive effects, or multiple treatment interference. There were no internal threats such as history, maturation, experimental mortality, or statistical regression (Ary et al., 2019).

The current study exhibited several possible threats to construct validity. The data was gathered from teachers in New Jersey who chose to participate in the study,

eliminating any concerns about selection bias. It was likely that teachers who were interested in using technology were the ones who may volunteer to take the survey, which was a limitation of the study. Teachers' backgrounds could have threatened the validity because teaching professionals at different levels had varied experiences using 1:1 technology in the classroom. The survey instruments were reviewed by my committee members and IRB for face validity, and their reliability and validity were affirmed separately in other studies. I reported estimates of reliability, as appropriate, in my Chapter 4 findings.

Ethical Procedures

For the purpose of the study, I applied all ethical procedures to the research to include the application to the Institutional Review Board (IRB) at Walden University to collect data. Upon approval of the IRB application, I began the recruitment process.

The ethical procedures in place were related to the treatment of human participants. The anonymity of participants after the initial email contact addressed most ethical concerns about participant recruitment. The survey was anonymous, and hence, under no undue influence was asserted. Participants were sent an e-mail that provided a summary of the study and a link to the survey. If a teacher was interested in participating in the study, the participant clicked on the link in the e-mail. The first page of the survey included the informed consent form (See Appendix F). After reading the informed consent, the teacher ill confirmed participation by selecting the "I Consent" link to proceed with the survey. The design of this procedure minimized any direct interaction with the participant. The online survey provided information about the research study as

well as the confidentiality of the data collection process. No coercive methods were used to obtain these permissions. I was clear in my correspondence that the districts were not associated with the study in any way and that all participation was voluntary. Once the teacher entered the survey, their identity was not captured, so their participation in the data they generated will remain anonymous. Inclusion in the study was based on whether they met the criteria of being a primary teacher utilizing 1:1 technology in classroom activities. After completing the survey, teachers will elect to submit to conclude the survey; therefore, there is no need for any follow-up activity with the participants. Institutional permissions, including IRB approvals, were obtained for this study. The IRB approval number for this study was (09-05-23-0664183).

The risks associated with this study were minimal. All risks were described in the consent documents. Contact information for myself, my university, and my chair was included to ensure any participants who have any questions about the study could obtain a response prior to their actual participation in the survey. Exclusion criteria for this study were minimal, limiting to those teachers outside of primary grade levels and outside of New Jersey. The inclusion criteria allowed any primary teacher who wished to participate in the opportunity to do so.

The following ethical procedures were adopted to ensure security and to maintain data integrity for the study. All the data collection will remain confidential, and any participant's identity, such as names and e-mail addresses, will be fully excluded. The research procedures were established to ensure privacy for the participants and the overall data collection process. The data will be stored securely on a password-protected

computer and will be destroyed once a five-year period has passed. The computer includes additional data protection features such as facial recognition software to turn on, and each folder on the computer is password protected to ensure the integrity of the data collection and is exclusive to the researchers' access. All paper documents were secured in a locked file cabinet for the duration of five years.

Summary

Chapter 3 provided a detailed description of the methodology that was used for this research. The population consisted of primary teachers from New Jersey who utilized 1:1 technology for classroom instruction. This research study aimed to determine if relationships existed between factors affecting technology acceptance, adoption rates (as reflected in levels of technology adoption), and teachers' perceptions based on the TAM, as well as perceived organizational and perceived technical support. The researcher collected data through an online survey tool to investigate possible relationships. Descriptive statistics and an Ordinal Logistic Regression were conducted to determine which variable had a statistically significant effect on the stage of adoption related to each research question. Ethical procedures for this study were followed to ensure that all participants' involvement was confidential and that the data would be kept safe and secure.

In Chapter 4, the data collection procedures will be detailed more in-depth. The overall statistical model will be presented along with the appropriate statistical data and tests for each independent variable. The results will be analyzed and explained in relation to each research question**.**

Chapter 4: Results

This quantitative study examined the relationship between New Jersey primary school teachers' reports of perceived usefulness, ease of use, organizational support, and technical support of a 1:1 device program and their self-reported stage of adoption. The following research questions and hypotheses guided the study:

RQ1: What is the relationship between teachers' self-reported perceptions of 1:1 device programs' usefulness and their stage of adoption?

$H_0$1: There is no significant relationship between teachers' self-reported perceptions of 1:1 device programs' usefulness and their stage of adoption.

H_a1: There is a significant relationship between teachers' self-reported perceptions of 1:1 device programs' usefulness and their stage of adoption.

RQ2: What is the relationship between teachers' self-reported perceptions of 1:1 device programs' ease of use and their stage of adoption?

$H_0$2: There is no significant relationship between teachers' self-reported perceptions of 1:1 device programs' ease of use and their stage of adoption.

H_a2: There is a significant relationship between teachers' self-reported perceptions of 1:1 device programs' ease of use and their stage of adoption.

RQ3: What is the relationship between teachers' self-reported perceptions of organizational support of 1:1 device programs and their stage of adoption?

$H_0$3: There is no significant relationship between teachers' self-reported perceptions of organizational support of 1:1 device programs and their stage of adoption.

H_a3: There is a significant relationship between teachers' self-reported perceptions of organizational support of 1:1 device programs and their stage of adoption.

RQ4: What is the relationship between teachers' self-reported perceptions of technical support of 1:1 device programs and their stage of adoption?

$H_0 4$: There is no significant relationship between teachers' self-reported perceptions of technical support of 1:1 device programs and their stage of adoption.

$H_a 4$: There is a significant relationship between teachers' self-reported perceptions of technical support of 1:1 device programs and their stage of adoption.

This chapter presents the data collection, analysis, and results using an ordinal logistical regression to answer each research question. The chapter also addresses how each research question was quantified and calculated in SPSS, including the results. The chapter concludes with a summary and transition to Chapter 5.

Data Collection

The time frame of the data collection was September 2023 to December 2023. After obtaining IRB approval from Walden University, I contacted New Jersey teachers through their work emails found online through their district and school websites. I sent teachers an email, including the informed consent form, describing the study with a link to the survey. A thousand emails were sent initially but had a poor response rate. Additional emails were sent to approximately 2,000 teachers. A friendly second and third

reminder was also sent due to the poor response rate. A total of 93 New Jersey primary teachers completed the survey. Participating teachers answered demographic questions and Likert scale questions, both featured in the SA survey (R. Christensen, 1997) and FTL-TTQ (Lowther et al., 2000). According to the G*Power sample size calculation (see Appendix A), at least 84 participants were needed. After collecting an acceptable number of survey responses, I closed the questionnaire. I downloaded the responses as a protected Excel file and saved them for the data analysis phase of the study.

A discrepancy in the data collection occurred during this study. Before deploying the survey, a technical issue required a recreation of the survey in Google Forms. When the survey was recreated, one of the possible question response items was not added. The survey response, which represented Stage 3 of the stages of adoption of technology (understanding and application of the process) was accidentally omitted. It should have stated, “I am beginning to understand the process of using technology and can think of specific tasks in which it might be useful.” Therefore, participants could only choose from the other five choices representing Stages 1, 2, 4, 5, and 6. Participants saw “I am aware that technology exists but have not used it – perhaps I’m even avoiding it,” representing Stage 1 Awareness; “I am currently trying to learn the basics. I am often frustrated using computers. I lack confidence when using computers” representing Stage 2 The Learning Process; “I am gaining a sense of confidence in using the computer for specific tasks. I am starting to feel comfortable using the computer” representing Stage 4 Familiarity and Confidence; “I think about the computer as a tool to help me and am no longer concerned about it as a technology. I can use it in many applications and as an

instructional aid" representing Stage 5: Adaptation to Other Contexts; and "I can apply what I know about technology in the classroom. I am able to use it as an instructional tool and integrate it into the curriculum" representing Stage 6 Creative Application to New Contexts. Due to this discrepancy, only five stages of adoption were examined to determine whether the independent factor variables affected these teachers' stages of adoption.

Demographics

The study was conducted with the voluntary participation of 93 New Jersey teachers. The sample's baseline descriptive and demographic data showed that 81.7% of teachers were female, 16.1% were male, and 2.2% preferred not to say. The age groups of the teachers in the sample were the following: 1.1% were 20 to 29, 11.8% were 30 to 39, 21.5% were 40 to 49, 25.8% were 50 to 59, 29% were 60 to 69, and 10.8% were 70 or older.

Regarding teaching experience, the smallest group of teachers (2.2%) had less than one year, and the largest group (33.3%) had 21 or more years of teaching experience. The remaining groups were 9.7% had 1 to 4 years, 28% had 5 to 10 years, and 26.9% had 11 to 20 years. For years taught at their present school, 6.5% were at their current school for less than one year, 36.6% were at their current school for 1 to 4 years, 30.1% were at their current school for 5 to 10 years, 15% were at their current school for 11 to 20 years, and 11.8% were at their current school for 21 or more years teaching. In reference to teachers' highest level of education achieved, the smallest group was 5.4% who had obtained a doctoral degree, and the largest group was 40.9% who obtained a

master's degree. The remaining participant percentages of degrees obtained were 32.3% participants obtained a bachelor's degree, and 21.5% participants obtained a second master or +30 credits above their bachelor's degree or a Specialist's degree.

The demographics concerning teachers' 1:1 use in the classroom provided background information for the study. A survey question asked teachers to choose from four statements that best describe their current use of 1:1 technology-based learning activities for their students during class. The lowest number of teachers (2.2%) responded none at all, , and the highest number of teachers (32.3%) responded moderately. The remaining teachers responded 28% for a great deal, 23.7% for a lot, and 14% for a little. In terms of the way students obtain 1:1 for use during class, 54.8% of teachers responded to students bringing school-issued devices to class, while 38.7% of teachers had students use a device from my classroom's set. Only 2.2% of teachers had students bring their self-owned devices to class. Four teachers (4.3%) did not fit into one category because they had multiple ways for students to access devices. One teacher had students who could access devices through all three methods, and three teachers had students who could use a device from the classroom set or bring a school-issued device. When looking at how often teachers use 1:1 devices in their classroom, the largest group of teachers (43%) use technology daily. In contrast, the smallest group of teachers (3.2%) use 1:1 devices less than once per month; 26.9% of teachers use 1:1 devices three to four times a week, 20.4% use 1:1 devices one to two times a week, and 6.5% use 1:1 devices one to two times a month. When looking at how much class time is dedicated to working with 1:1 devices, the smallest group of teachers (5.4%) answered all or most. In contrast, the

largest group of teachers (41.9%) answered about one fourth of the class. The other groups indicated that 11.8% use 1:1 devices for three fourths of the class, 28% use 1:1 devices for one half of the class, and 12.9% use 1:1 devices for very little or none of the class. Table 2 shows the participants' stage of adoption.

Table 2

Participant Stage of Adoption

Stage of adoption	Frequency	Percentage	Cumulative percentage
1. Awareness	7	7.5%	7.5%
2. Learning the process	4	4.3%	11.8%
3. Familiarity and confidence	11	11.8%	23.7%
4. Adaption to other contexts	29	31.2%	54.8%
5. Creative applications to new content	43	45.2%	100%
Total	93	100%	

The sample was gathered using nonprobability convenience sampling. Ninety-three primary educators in New Jersey chose to complete the survey they received in an email. This sample type was purposeful and constitutes a convenience sampling approach using the available population (see Stratton, 2021). To the extent that teachers told other teachers about the survey, there was also a snowball sampling effect in my sampling strategy (see Stratton, 2021). The sample population was representative of the larger population because the New Jersey Department of Education reported that in 2022–2023,

there were 116,698 teachers, of whom 22.8% were male and 77.2% were female, which was similar to the sample population in my study. It was unknown whether the sample was representative of the overall population in other demographic areas because there was a lack of information from the New Jersey Department of Education on teachers' race and gender.

The grade level taught question in the survey allowed participants to respond with multiple answers. The lowest number of grades taught by any teacher was one, and 51 teachers taught one grade. The highest number of grades taught by any teacher was nine, and five teachers taught nine grades. The courses taught question in the survey allowed participants to respond with multiple answers. Most participants taught only one course and reported that course as either regular or special education. Four participants reported that the course type taught was other. The highest number of courses taught was five (remedial, special education, general education, honors, and other), and one participant reported teaching all five courses. All participants reported having internet access at home, but only 94.6% reported having a computer at home. These demographic data show that the sample was diverse and represented all primary teachers at all levels.

Results

The first statistical assumption for an ordinal logistic regression is that the study has an ordinal dependent variable (Laerd Statistics, 2015). In the current study, the SA is a single-item, forced-choice measure of the level of technology adoption. The second assumption for an ordinal logistic regression is that there are one or more independent variables (Laerd Statistics, 2015); in the current study, there were four ordinal

independent variables. The third assumption is the variables are not multicollinear. This assumption was met because the variables were not continuous but ordinal, in which the participants selected one response on a Likert scale (see Laerd Statistics, 2015). The fourth assumption is that the variables need to have proportional odds (Laerd Statistics, 2015). I ran the proportional odds test for each of the variables to verify that Assumption 4 was met.

The statistical analysis was conducted with an ordinal logistic regression using SPSS Version 27. Each research question was addressed using the odds ratio formula. The odds ratio formula is EXP(B) – 1.00 x 100. This formula provided a statistical understanding of whether there was a positive or negative movement between the variables to show how each factor was related to the stage of adoption.

RQ1

What is the relationship between teachers' self-reported perceptions of 1:1 device programs' usefulness and their stage of adoption? For RQ1, the assumption of proportional odds was not met, as assessed by a full likelihood ratio test comparing the fit of the proportional odds location model to a model with varying location parameters, $\chi 2(1) = 13.679620$, $p = .001$ (see Table 3). The proportional odds were violated by having a statistically significant test ($p < .05$). According to Laerd Statistics (2015), an acceptable method for handling this violation is to run a binomial regression. A binomial regression, however, could not be completed due to the variable being multinomial. A multinomial regression could have been used, but the dependent variable would have lost

its ordinal nature, which was vital to the study. The data analysis using an ordinal logistic regression was completed, understanding this was a limitation.

The deviance goodness-of-fit test indicated that the model fit the observed data well, $\chi 2(75) = 61.045$, $p = .878$ (see Table 4). Therefore, an ordinal logistic regression analysis was conducted to address RQ1, the relationship between teachers' self-reported perceptions of 1:1 device programs' perceived usefulness and their stage of adoption. The dependent variable was the stage of adoption, which had five levels with four thresholds. The levels were Awareness, Learning the Process, Familiarity and Confidence, Adoption to Other Contexts, and Creative Applications to New Contexts. The threshold between awareness and learning the process was -.108, with a significance of .888. The threshold between learning the process and Familiarity and Confidence was .414, with a significance of .578. The threshold between Familiarity and Confidence and Adoption to Other Contexts was 1.272, with a significance of .088. The threshold between Adoption to Other Contexts and Creative Applications to New Contexts was 2.795, with a significance of < .001 (see Table 5). Only Threshold 4, moving from Adoption to Other Contexts to Creative Applications to New Contexts, was statistically significant. In the ordinal logistic regression analysis, the predictor variable (perceived usefulness) contributed to the model. For every increase in the perceived usefulness, there was a positive increase in the stage of adoption. Using the resulting estimate of .138, the prediction formula was calculated as EXP(.138) – 1.00 x 100 = 14.79. As the perceived usefulness increased, there was a positive movement of 14.79% toward Level 5 (Creative Applications to New Contexts) of the stage of adoption, where a teacher feels as though

they can apply what they know about technology in the classroom and can use it as an instructional tool and integrate it into the curriculum. Therefore, the null hypothesis was rejected, indicating there was a significant relationship between teachers' self-reported perceptions of 1:1 device programs' usefulness and their stage of adoption.

Table 3

RQ1 Model Fitting Information

Model	-2 log likelihood	Chi-square	*Df*	Sig
Intercept only	127.546			
Final	113.867	13.679	1	<.001

Table 4

RQ1 Goodness of Fit

Test	Chi-square	*Df*	Sig
Pearson	61.215	75	.874
Deviance	61.945	75	.878

Table 5

RQ1 Parameter Estimates

Test	Variable	Estimate	Std. error	Wald	*df*	Sig	95% confidence interval	
							Lower bounds	Upper bounds
Threshold	SOA =1	-.108	.764	.020	1	.88	-1.605	1.390
	SOA =2	.414	.744	.309	1	.578	-1.045	1.972
	SOA =3	1.272	.745	2.915	1	.088	-.188	2.733
	SOA =4	2.795	.793	12.406	1	<.001	1.240	4.350
Location	Usefulness	.138	.040	11.952	1	<.001	.060	.216

RQ2

What is the relationship between teachers' self-reported perceptions of 1:1 device programs' ease of use and their stage of adoption? For RQ2, the assumption of proportional odds was not met, as assessed by a full likelihood ratio test comparing the fit of the proportional odds location model to a model with varying location parameters, $\chi2(1) = 19.216$, $p = .001$ (see Table 6). The proportional odds were violated by having a statistically significant test ($p < .05$). As per Laerd Statistics (2015), an acceptable method for handling this violation is to run a binomial regression (Laerd Statistics, 2015). A binomial regression, however, could not be completed due to the variable being multinomial. A multinomial regression could also be used instead, but the dependent variable would lose its ordinal nature, which is vital to the study. The data analysis was completed, understanding this is a limitation using an ordinal logistic regression. The deviance goodness-of-fit test indicated that the model fit the observed data well, $\chi2(51) = 62.939$, $p = .122$ (see Table 7). Therefore, an ordinal logistic regression analysis was conducted to investigate RQ2, the relationship between teachers' self-reported perceptions of 1:1 device programs *ease of use* influence their *stage of adoption*. The dependent variable was the *stage of adoption*, which had five levels with four thresholds. The levels are as follows: Awareness, Learning the Process, Familiarity and Confidence, Adoption to Other Contexts, and Creative Applications to New Contexts. The threshold between awareness and learning the process was 2.177, with a significance of .051. The threshold between learning the process and Familiarity and Confidence was 2.745, with a significance of .014. The threshold between Familiarity and Confidence and Adoption to

Other Contexts was 3.713, with a significance of .001. The threshold between Adoption to Other Contexts and Creative Applications to New Contexts was 5.323, with a significance of $p < .001$ (see Table 8). Threshold two (moving from Learning the Process to Familiarity and Confidence), Threshold three (moving from Familiarity and Confidence to Adoption to Other Contexts), and Threshold four (moving from Adoption to Other Contexts to Creative Applications to New Contexts) were statistically significant. In the ordinal logistic regression analysis, the predictor variable, *perceived ease of use*, contributed to the model. For every increase in *perceived ease of use*, there was a positive increase in the *stage of adoption.* Using the resulting estimate of .242, the prediction formula was calculated as Exp(.242)-1.00x100= 27.37. As the *perceived ease of use* increases, there is a positive movement of 27.37% toward level two (moving from Learning the Process to Familiarity and Confidence), level three (moving from Familiarity and Confidence to Adoption to Other Contexts), level four (Adoption to Other Contexts) and level five (Creative Applications to New Contexts) of the stages of adoption. Therefore, the null hypothesis $H_0$2: There is no significant relationship between teachers' self-reported perceptions of 1:1 device programs' ease of use and their stage of adoption was rejected, indicating there is a significant relationship between teachers' self-reported perceptions of 1:1 device programs' ease of use and their stage of adoption.

Table 6

RQ2 Model Fitting Information

Model	-2 log likelihood	Chi-square	*Df*	Sig
Intercept only	125.935			
Final	106.719	19.216	1	<.001

Table 7

RQ2 Goodness of Fit

Test	Chi-square	*df*	Sig
Pearson	63.652	51	.110
Deviance	62.939	51	.122

Table 8

RQ2 Parameter Estimates

	Variable	Estimate	Std. error	Wald	*df*	Sig	95% confidence interval	
							Lower bounds	Upper bounds
Threshold	SOA =1	2.177	1.116	3.807	1	.051	-.010	4.364
	SOA =2	2.745	1.118	6.029	1	.014	.554	4.936
	SOA =3	3.713	1.147	10.479	1	.001	1.465	5.960
	SOA =4	5.323	1.215	19.202	1	<.001	2.942	7.704
Location	Ease of use	.242	.056	18.507	1	<.001	.132	.353

RQ3

What is the relationship between teachers' self-reported perceptions of organizational support of 1:1 device programs and their stage of adoption? For RQ3, the assumption of proportional odds was met, as assessed by a full likelihood ratio test comparing the fit of the proportional odds location model to a model with varying

location parameters, $\chi 2(1) = 4.315$, $p = .038$ (see Table 9). Next, the deviance goodness-of-fit test indicated that the model fit the observed data well, $\chi 2(67) = 66.144$, $p = .507$ (see Table 10). Therefore, an ordinal logistic regression analysis was conducted to investigate RQ3, the relationship between teachers' self-reported perceptions of organizational support of 1:1 device programs influencing their *stage of adoption*. The dependent variable was the *stage of adoption*, which has five levels with four thresholds. The levels are as follows: Awareness, Learning the Process, Familiarity and Confidence, Adoption to Other Contexts, and Creative Applications to New Contexts. The threshold between awareness and learning the process was -.874, with a significance of .311. The threshold between learning the process and Familiarity and Confidence was -.367 with a significance of .662. The threshold between Familiarity and Confidence and Adoption to Other Contexts was .483, with a significance of .558. The threshold between Adoption to Other Contexts and Creative Applications to New Contexts was 1.896, with a significance of .025 (see Table 11).

Threshold four (moving from Adoption to Other Contexts to Creative Applications to New Contexts) was statistically significant. In the ordinal logistic regression analysis, the predictor variable, *perceived organizational support*, contributed to the model. For every increase in *perceived organizational support,* there was a positive increase in the *stage of adoption.* Using the resulting estimate of .095, the prediction formula was calculated as Exp (.095)-1.00x100= 9.96. As the *perceived organizational support* increases, there is a positive movement of 9.96% toward level four (Adoption to Other Contexts) and level five (Creative Applications to New Contexts) of the stages of

adoption. Therefore, the null hypothesis $H_0$3: There is no significant relationship between teachers' self-reported perceptions of organizational support of 1:1 device programs and their stage of adoption was rejected, indicating there is a significant relationship between teachers' self-reported perceptions of 1:1 device programs' *organizational support* and their *stage of adoption*.

Table 9

RQ3 Model Fitting Information

Model	-2 log likelihood	Chi-square	*df*	Sig
Intercept only	126.302			
Final	121.987	4.315	1	.038

Table 10

RQ3 Goodness of Fit

Test	Chi-square	*Df*	Sig
Pearson	62.865	67	.621
Deviance	66.144	67	.507

Table 11

RQ3 Parameter Estimates

	Variable	Estimate	Std. error	Wald	*df*	Sig	95% confidence interval	
							Lower bounds	Upper bounds
Threshold	SOA =1	-.874	.864	1.025	1	.311	-2.567	.818
	SOA =2	-.367	.838	.192	1	.662	-2.009	1.275
	SOA =3	.483	.824	.343	1	.558	-1.133	2.099
	SOA =4	1.896	.847	5.008	1	.025	.235	3.556
Location	Organizational support	.095	.046	4.337	1	.037	.006	.184

RQ4

What is the relationship between teachers' self-reported perceptions of technical support of 1:1 device programs and their stage of adoption? For RQ4, the assumption of proportional odds was met, as assessed by a full likelihood ratio test comparing the fit of the proportional odds location model to a model with varying location parameters, $\chi 2(1) = 1.746$, $p = .185$ (see Table 12). Next, the deviance goodness-of-fit test indicated that the model fit the observed data well, $\chi 2(119) = 102.226$, $p = .864$ (see Table 13). Therefore, an ordinal logistic regression analysis was conducted to investigate RQ4, the relationship between teachers' self-reported *perceived technical support* of 1:1 device programs and their *stage of adoption*. The dependent variable was the *stage of adoption*, which has five levels with four thresholds. The levels are as follows: Awareness, Learning the Process, Familiarity and Confidence, Adoption to Other Contexts, and Creative Applications to New Contexts. The threshold between awareness and learning the process was -1.627 with a significance of .034. The threshold between learning the process and Familiarity

and Confidence was -1.124 with a significance of .128. The threshold between Familiarity and Confidence and Adoption to Other Contexts was -.287, with a significance of .688. The threshold between Adoption to Other Contexts and Creative Applications to New Contexts was 1.094, with a significance of .130 (see Table 14). The predictor variable, *perceived technical support,* was not found to contribute to the model in a statistically significant way. Therefore, I failed to reject the null hypothesis of no significance for *perceived technical support* of 1:1 device programs and their *stage of adoption*.

Table 12

RQ4 Model Fitting Information

Model	-2 log likelihood	Chi-square	*df*	Sig
Intercept only	157.305			
Final	155.559	1.746	1	.185

Table 13

RQ4 Goodness of Fit

Test	Chi-square	*df*	Sig
Pearson	134.737	119	.154
Deviance	102.228	119	.864

Table 14

RQ4 Parameter Estimates

	Variable	Estimate	Std. error	Wald	*df*	Sig	95% confidence interval	
							Lower bounds	Upper bounds
Threshold	SOA =1	-1.627	.769	4.476	1	.034	-3.135	-.120
	SOA =2	-1.125	.738	2.322	1	.128	-2.570	.322
	SOA =3	-.287	.715	.161	1	.688	-1.688	1.115
	SOA =4	1.094	.723	2.288	1	.130	-.324	2.512
Location	Technical support	.034	.026	1.732	1	.188	-.017	.086

After finding that technology support for all the variables was not statistically significant, I broke up the variables by category. There were two categories: *general technical support* and *coaching technical support*, to see if either of the sets of variables were statistically significant. For *general technical support*, the assumption of proportional odds was not met, as assessed by a full likelihood ratio test comparing the fit of the proportional odds location model to a model with varying location parameters, $\chi2(1) = 7.559$, $p = .006$ (see Table 15). The proportional odds were violated by having a statistically significant test ($p < .05$). As per Laerd Statistics (2015), an acceptable method for handling this violation is to run a binomial regression (Laerd Statistics, 2015).

A binomial regression, however, could not be completed due to the variable being multinomial. A multinomial regression could also be used instead, but the dependent variable would lose its ordinal nature, which is vital to the study. The data analysis was completed understanding this is a limitation. Next, the deviance goodness-of-fit test indicated that the model was a good fit to the observed data fit the observed data well, $\chi 2(63) = 66.605$, $p = .354$ (see Table 16). Therefore, an ordinal logistic regression analysis was conducted to further investigate RQ4, the relationship between teachers' self-reported perceptions of *general technical support* of 1:1 device programs influencing their stage of adoption.

The dependent variable was the stage of adoption, which has five levels with four thresholds. The levels are Awareness, Learning the Process, Familiarity and Confidence, Adoption to Other Contexts, and Creative Applications to New Contexts. The threshold between awareness and learning the process was -.720, with a significance of .969. The threshold between learning the process and Familiarity and Confidence was -.198 with a significance of .079. The threshold between Familiarity and Confidence and Adoption to Other Contexts was .663, with a significance of .909. The threshold between Adoption to Other Contexts and Creative Applications to New Contexts was 2.101 with a significance of .004 (see Table 17). In the ordinal logistic regression analysis, the predictor variable, *perceived general technical support*, was found to contribute to the model because it was statistically significant.

Threshold four (moving from Adoption to Other Contexts to Creative Applications to New Contexts) was statistically significant. In the ordinal logistic

regression analysis, the predictor variable, *perceived general technical support*, contributed to the model. For every increase in *perceived general technical support*, there was a positive increase in the *stage of adoption.* Using the resulting estimate of .129, the prediction formula was calculated as Exp(.129)-1.00x100= 13.76. As the *perceived general technical support* increases, there is a positive movement of 13.76% toward level four (Adoption to Other Contexts) and level five (Creative Applications to New Contexts) of the stages of adoption.

Therefore, the null hypothesis $H_0$4: There is no significant relationship between teachers' self-reported perceptions of *general technical support* of 1:1 device programs, and their stage of adoption was rejected, indicating there is a significant relationship between teachers' self-reported perceptions of 1:1 device programs' *general technical support* and their stage of adoption.

Table 15

RQ4 Model Fitting Information

Model	-2 log likelihood	Chi-square	*df*	Sig
Intercept only	123.757			
Final	116.198	7.559	1	.006

Table 16

RQ4 Goodness of Fit

Test	Chi-square	*df*	Sig
Pearson	66.108	63	.370
Deviance	66.605	63	.354

Table 17

RQ4 Parameter Estimates

	Variable	Estimate	Std. error	Wald	*df*	Sig	95% confidence interval	
							Lower bounds	Upper bounds
Threshold	SOA =1	-.720	.731	.969	1	.325	-2.153	.713
	SOA =2	-.199	.704	.079	1	.779	-1.578	1.182
	SOA =3	.663	.695	.909	1	.340	-.700	2.025
	SOA =4	2.101	.729	8.319	1	.004	.673	2.529
Location	General technology support	.129	.047	7.542	1	.006	.037	.220

For *coaching technical support*, the assumption of proportional odds was met, as assessed by a full likelihood ratio test comparing the fit of the proportional odds location model to a model with varying location parameters, $\chi2(1) = .117$, $p = .732$ (see Table 18). Next, the deviance goodness-of-fit test indicated that the model fit the observed data well, $\chi2(59) = 59.286$, $p = .465$ (see Table 19). Therefore, an ordinal logistic regression analysis was conducted to investigate RQ4, the relationship between teachers' self-reported *perceived coaching technical support* of 1:1 device programs influence their *stage of adoption*. The dependent variable was the *stage of adoption*, which has five levels with four thresholds. The levels are Awareness, Learning the Process, Familiarity and Confidence, Adoption to Other Contexts, and Creative Applications to New Contexts. The threshold between awareness and learning the process was -2.666 with a significance of $p <. 001$. The threshold between learning the process and Familiarity and Confidence was -2.166 with a significance of $p <.001$. The threshold between Familiarity and Confidence and Adoption to Other Contexts was -1.326, with a significance of $p =$

.011. The threshold between Adoption to Other Contexts and Creative Applications to New Contexts was .041, with a significance of $p = .935$ (see Table 20). In the ordinal logistic regression analysis, the predictor variable, *perceived coaching technical support*, was found to contribute to the model and is statistically significant.

Threshold one (moving from Awareness to Learning the Process), Threshold two (Moving from Learning the Process to Familiarity and Confidence), and threshold three (moving from Familiarity and Confidence to Adoption) were statistically significant. In the ordinal logistic regression analysis, the predictor variable, *perceived coaching technical support*, contributed to the model. For every increase in *perceived coaching technical support,* there was a positive increase in the *stage of adoption.* Using the resulting estimate of. -0.013, the prediction formula was calculated as Exp(-.013)-1.00x100= -1.29. As the *perceived coaching technical support* increases, there is a negative movement of 1.29% from level three (moving from Familiarity and Confidence to Adoption) toward level two (Moving from Learning the Process to Familiarity and Confidence) and down from level one (moving from Awareness to Learning the Process), of the *stages of adoption*.

Therefore, the null hypothesis $H_0$4: There is no significant relationship between teachers' self-reported *perceived coaching technical support* of 1:1 device programs, and their stage of adoption failed to be accepted, indicating there is a significant relationship between teachers' self-reported perceptions of 1:1 device programs' *coaching technical support* and their *stage of adoption*.

Table 18

RQ4 Model Fitting Information

Model	-2 log likelihood	Chi-square	*df*	Sig
Intercept only	113.307			
Final	113.190	.117	1	.732

Table 19

RQ4 Goodness of Fit

Test	Chi-square	*df*	Sig
Pearson	64.275	59	.370
Deviance	59.286	59	.354

Table 20

RQ4 Parameter Estimates

	Variable	Estimate	Std. error	Wald	*df*	Sig	95% confidence interval	
							Lower bounds	Upper bounds
Threshold	SOA =1	-2.666	.608	19.222	1	<.001	-3.858	-1.474
	SOA =2	-1.166	.564	14.759	1	<.001	-3.271	-1.061
	SOA =3	-1.326	.522	6.455	1	.340	-2.349	-.303
	SOA =4	.041	.502	.007	1	.004	-.942	1.024
Location	Coaching technology support	-.013	.039	.119	1	.006	-.090	.063

Summary

Chapter 4 started with a review of the purpose and research questions. Next, I looked at the methods of data collection. Ninety-three New Jersey Primary Teachers participated in the survey. The data was collected and entered into SPSS for analysis.

There were several key findings in the study. The data indicated that perceived usefulness, ease of use, organizational support, and, when separated from overall technology support and broken into, general technology support and coaching technology support are statistically significant factors in a teacher's stage of adoption. The findings indicate that perceived usefulness was significant. As a teacher finds 1:1 devices more useful, there is a positive relationship, showing a 14.79% movement toward a higher stage of adoption. The findings indicate that perceived ease of use was significant. As a teacher finds 1:1 devices are perceived as easy to use, there is a positive relationship, showing a 27.47% movement toward a higher stage of adoption. The findings indicate that perceived organizational support was significant. As a teacher finds there is organizational support for 1:1 devices, there is a positive relationship, showing a 9.96% movement toward a higher stage of adoption. Findings indicate that perceived general technical support was significant. As a teacher perceives technical support for 1:1 devices is available in their school, there is a positive relationship, showing a 13.76% movement toward a higher stage of adoption. The findings indicate that perceived coaching support was significant. As a teacher perceives coaching technical support for 1:1 devices is available in their school, there is a negative relationship, showing a backward movement of 1.29% towards a lower stage of adoption. In Chapter 5, there will be a detailed discussion of the results. Conclusions will be drawn from each research question, and recommendations for future research around primary teachers' perceptions and Stages of Adoption will be made.

Chapter 5: Discussion, Conclusions, and Recommendations

The purpose of this nonexperimental quantitative study was to examine the relationship between New Jersey primary school teachers' technology acceptance of a 1:1 device program and their perceived usefulness, perceived ease of use, perceived organizational support, and perceived technical support affecting their reported adoption stage. The findings indicated that perceived usefulness, ease of use, organizational support, and, when separated from overall technology support and broken into general technology support and coaching technology support, were statistically significant factors in teachers' stage of adoption. The findings indicated that perceived usefulness, ease of use, organizational support, and general technology support had a positive relationship with a teachers' stage of adoption. The findings indicated that coaching technology support was significant but had a negative relationship with teachers' stage of adoption.

In this chapter, findings are interpreted, and study limitations are explained. I also provide recommendations for future research and the implications of the study, demonstrating how the findings are applicable in practice and how they support positive social change. Finally, the conclusion reviews the essential findings and takeaways of the study.

Interpretation of the Findings

Analysis of survey data indicated that perceived usefulness, perceived ease of use, perceived organizational support, and (when separated) perceived general technology support and perceived coaching technology support were statistically significant factors in teachers' stage of adoption. The findings indicated that perceived

usefulness was significant. As a teacher finds 1:1 devices more useful, there is a positive relationship, showing a 14.79% movement toward a higher stage of adoption. The findings indicated that perceived ease of use was significant. As a teacher finds 1:1 devices are perceived as easy to use, there is a positive relationship, showing a 27.47% movement toward a higher stage of adoption. The findings indicated that perceived organizational support was significant. As a teacher finds there is organizational support for 1:1 devices, there is a positive relationship, showing a 9.96% movement toward a higher stage of adoption. Findings indicated that perceived general technical support was significant. As a teacher perceives technical support for 1:1 devices is available in their school, there is a positive relationship, showing a 13.76% movement toward a higher stage of adoption. The findings indicated that perceived coaching support was significant. As a teacher perceives coaching technical support for 1:1 devices is available in their school, there is a negative relationship, showing a backward movement of 1.29% toward a lower stage of adoption. Table 21 shows the literature associated with each research question.

Table 21

Literature for Research Questions

RQ	Study finding	Confirms the literature	Disconfirms the literature	Extends the literature
RQ1: How do teachers' self-reported perceptions of 1:1 device programs usefulness influence their stage of adoption?	The first finding in the ordinal logistic regression analysis, the predictor variable, perceived usefulness, contributed to the model. Every increase in perceived usefulness resulted in a positive increase in the *stage of adoption.* Using the resulting estimate of .138, the prediction formula was calculated as EXP(.138)-1.00x100= 14.79. As the *perceived usefulness* increases, there is a positive movement of 14.79%	Teo et al., 2018. Xu and Zhu, 2020.		Bergström and Wiklund-Engblom, 2022. Khlaif, 2018.
RQ2: How do teachers' self-reported perceptions of 1:1 device programs ease of use influence their stage of adoption?	The second finding in the ordinal logistic regression analysis, the predictor variable, *perceived ease of use*, contributed to the model. For every increase in *perceived ease of use*, there was a positive increase in the *stage of adoption.* Using the resulting estimate of .242, the prediction formula was calculated as Exp(.242)-1.00x100= 27.37. As the *perceived ease of use* increases, there is a positive movement of 27.37%	Xu & Zhu, 2020.	Teo et al., 2018	Khlaif, 2018.
RQ3: How do teachers' self-reported perceptions of organizational support of 1:1 device programs influence their stage of adoption?	The third finding in the ordinal logistic regression analysis, the predictor variable, *perceived organizational support*, contributed to the model. Every increase in perceived organizational support resulted in a positive increase in the *stage of adoption.* Using the resulting estimate of .095, the prediction formula was calculated as Exp (.095)-1.00x100= 9.96. As the *perceived organizational*	Gherardi, 2020. Goh and Sigala, 2020. O'Neal et al. (2017). Durff and Carter (2019).		Khlaif, 2018.

	support increases, there is a positive movement of 9.96%			
RQ4: How do teachers' self-reported perceptions of Technical Support of 1:1 device programs influence their stage of adoption? General Technical Support	The fourth finding in the ordinal logistic regression analysis, the predictor variable, *perceived general technical support*, contributed to the model. For every increase in *perceived general technical support*, there was a positive increase in the *stage of adoption.* Using the resulting estimate of .129, the prediction formula was calculated as Exp(.129)-1.00x100= 13.76. As the *perceived general technical support* increases, there is a positive movement of 13.76%	Peterson and Scharber, 2017. Francom, 2020. Khlaif, 2018.		O'Neal et al., 2017.
RQ4: How do teachers' self-reported perceptions of Technical Support of 1:1 device programs influence their stage of adoption? Coaching Technical Support	The fifth finding in the ordinal logistic regression analysis, the predictor variable, *perceived coaching technical support*, contributed to the model. For every increase in *perceived coaching technical support*, there was a positive increase in the *stage of adoption.* Using the resulting estimate of. -0.013, the prediction formula was calculated as Exp(-.013)-1.00x100= -1.29. As the *perceived coaching technical support* increases, there is a negative movement of 1.29%		Goh and Sigala, 2020. Seif and Biranvand, 2019. Khlaif, 2018. Durff and Carter, 2019. Peterson and Scharber, 2017. Francom, 2020.	

RQ1

What is the relationship between teachers' self-reported perceptions of 1:1 device programs' usefulness and their stage of adoption? For RQ1, in the ordinal logistic regression analysis, the predictor variable perceived usefulness contributed to the model. As a teacher finds 1:1 devices more useful, there is a positive relationship, showing a 14.79% movement toward a higher stage of adoption. Data from the study confirm the

findings of Teo et al. (2018) that perceived usefulness was found to be significant. Although Teo et al. looked at the perceptions of 183 English teachers at the university level, perceived usefulness also has a relationship with how primary teachers choose to use 1:1 devices in the classroom. This demonstrates that perceived usefulness, which was known to be a significant factor at the university level (Teo et al., 2018), is a significant factor at the primary level.

Xu and Zhu (2020) found statistical significance in teachers' acceptance and use of mobile technology in the classroom, which depended on their perceptions, attitudes, beliefs, and self-efficacy with technology. Meanwhile, teachers' mobile device skills and mobile-based pedagogical knowledge strongly influenced their self-efficacy in mobile device-based teaching (Xu & Zhu, 2020). Data from the current study confirm that perceptions have a relationship to teachers' beliefs and their stage of adoption, which affects the adoption of technology in the classroom. Both studies demonstrated that teachers who find 1:1 devices useful will implement and use them in their classrooms.

Findings from my study extend Bergström and Wiklund-Engblom's (2022) understanding of 1:1 devices in the classroom and the importance of teachers' ability to find technology useful and adapt to its use in the classroom. Bergström and Wiklund-Engblom found that using 1:1 devices for higher order goals is vital to address the needs of students, promotes student autonomy, and allows them to work individually and in groups instead of the teacher being a facilitator and directing the work, changing the fundamentals of teaching with its use. Bergström and Wiklund-Engblom's research indicated that perceived usefulness is a factor in the use of technology. However, my

study found that it is more than perceived usefulness that has significance; ease of use, organizational support, and technical support also play a role in a teacher's stage of adoption and use of 1:1 devices in the classroom.

Findings from my study also confirm and extend the research of Khlaif (2018), who examined teachers' perceptions of mobile technology in K–12 and found that 60% of participants asserted that their previous experiences with instruction using 1:1 tablets had a positive influence on their current attitudes toward adopting and accepting tablets in their teaching practices. Findings indicated that perceived usefulness for teachers affected their stage of adoption. The results of my study showed that factors such as perceived usefulness play a significant role in teachers' having a higher stage of adoption and integrating the devices into the classroom. When these factors are studied in educational institutions and districts, perceived usefulness is one of the most vital factors.

RQ2

What is the relationship between teachers' self-reported perceptions of 1:1 device programs' ease of use and their stage of adoption? For RQ2, in the ordinal logistic regression analysis, the predictor variable (perceived ease of use) contributed to the model. As a teacher finds 1:1 devices are perceived as easy to use, there is a positive relationship, showing a 27.47% movement toward a higher stage of adoption. Xu and Zhu (2020) found statistical significance in teachers' acceptance and use of mobile technology in the classroom, which depended on their perceptions, attitudes, beliefs, and self-efficacy with technology. Meanwhile, teachers' mobile device skills and mobile-based pedagogical knowledge strongly influenced their self-efficacy in mobile device-

based teaching (Xu & Zhu, 2020). Data from the current study confirm that perceptions have a relationship to teachers' beliefs and their stage of adoption, which affects the adoption of technology in the classroom. My study demonstrated that teachers who find 1:1 devices easy to use will implement and use them in their classrooms.

My study, in part, disconfirms the findings of Teo et al. (2018), who looked at the university teachers' perceptions and did not find perceived ease of use statistically significant. My study found ease of use to be a highly significant factor; when ease of use increases in 1:1 devices, there is a positive movement of 27.47% in the stage of adoption. Perhaps the ease of use did not factor in at the particular university in Teo et al.'s study because those hired were already proficient in the use of technology to teach university-level students. However, in other studies of K–12, ease of use was found to be significant (Khlaif, 2018; Xu & Zhu, 2020).

Findings from my study also confirm and extend the research of Khlaif (2018), who examined teachers' perceptions of mobile technology in K–12 and found that 60% of participants asserted that their previous experiences with instruction using 1:1 tablets had a positive influence on their current attitudes toward adopting and accepting tablets in their teaching practices. Findings indicated that 60% of teachers considered using tablets easy for them (perceived ease of use). Khlaif found that approximately one third of the teachers reported that their prior experience and knowledge contributed to their proficiency in operating the tablets, which is confirmed in my study. Additionally, Khlaif observed that two thirds of the teachers could use the devices independently and easily without needing external support. At the same time, one half indicated they were familiar

with and comfortable using devices during classroom instruction. The results of my study showed that factors such as perceived ease of use play a significant role in teachers having a higher stage of adoption and integrating the devices into the classroom. When these factors are studied in educational institutions and districts, perceived ease of use is one of the most vital factors administrators must account for.

RQ3

What is the relationship between teachers' self-reported perceptions of organizational support of 1:1 device programs and their stage of adoption? For RQ3, in the ordinal logistic regression analysis, the predictor variable (perceived organizational support) contributed to the model. As a teacher finds there is organizational support for 1:1 devices, there is a positive relationship, showing a 9.96% movement toward a higher stage of adoption.

Goh and Sigala (2020) found that organizational support was essential for administrators to give along with their ability to pick their innovators and early adopters and assign these individuals as ambassadors, mentors, or coaches, or provide opportunities to ensure teachers are knowledgeable about the new technology. Data from the current study confirm these findings that as organizational support increases, there is an increase in the stage of adoption. Current findings also confirm Gherardi's (2020) findings, which indicated how teachers and administrators understood the use of 1:1 technology in the classroom differently. My study found that organizational support was a significant factor in a teacher's stage of adoption. Gherardi's data showed that understanding policy goals influenced the evaluation of policy outcomes and created a

dissonance between teachers and administrators. The messaging about 1:1 devices and organizational support was found to matter, and monitoring and correcting the interpretation of policy messages is necessary. Whereas administrators were not worried about high turnover, buy-in, or use factors of 1:1 technology, this made teachers feel unsupported and that the administration and district had taken the wrong path of technology adoption into the classroom.

Findings from Gherardi's (2020) study combined with my study show it is essential that school and district administration pay attention not only to the messaging they send out but also to the types of organizational and general technical support they provide to teachers. Research indicated this will increase buy-in from teachers on 1:1 devices. Also, if teachers feel these supports are useful, it will have a positive influence on their stage of adoption.

The findings of Durff and Carter (2019) showed that organizational support affects teachers' adoption of 1:1 devices in the classroom. Durff and Carter noted that administrators are in an excellent position to encourage their teachers to integrate technology and positively influence student achievement in their schools. My study confirms these findings. Durff and Carter found that through multiple levels of support, administrators make a difference in the adoption of technology in the classroom of primary educators in rural areas. Durff and Carter's research indicated that providing technical support allows teachers' technology skills to evolve through support. Teachers then find the technology easier to use, valuing the use of technology and its usefulness. Teachers feel administrators are vital in supporting them in overcoming barriers.

While my study confirms Khlaif's (2018) findings that perceived ease of use, usefulness, and general technical support are significant factors, my study extends Khlaif's because the study also showed that organizational support plays a significant role in teachers' stage of adoption of technology in the classroom (Khlaif, 2018). My study also confirms and extends O'Neal et al. (2017), who examined teachers' beliefs about the role of technology in the classrooms through focus groups. That study found that teachers saw the importance of incorporating technology into teaching and learning. However, there were barriers noted for future research, specifically for organizational support. As O'Neal et al. noted, teachers felt they needed guidance and support from the administration, which impacted their use of devices (O'Neal et al., 2017). My study showed that organizational support has a significant relationship with a teacher's stage of adoption, which aligns with teachers' feedback from the focus groups on why they weren't utilizing the technology even after they felt it was important.

RQ4

What is the relationship between teachers' self-reported perceptions of technical support of 1:1 device programs and their stage of adoption? For RQ4, there were two categories: *general technical support* and *coaching technical support;* therefore, the implications will be broken up by category.

For *general technical support* in the ordinal logistic regression analysis, the predictor variable, *perceived general technical support*, contributed to the model. As a teacher perceives technical support for 1:1 devices is available in their school, there is a positive relationship, showing a 13.76% movement toward a higher stage of adoption.

Peterson and Scharber (2017) found the importance of integrating technology across the school and the factors that affect implementation, such as supporting early adopters and ensuring technical support such as reliable internet (Peterson & Scharber, 2017). Francom (2020) looked at smaller school districts in the North Midwestern United States for K–12 schools and found that time was the most significant barrier category (60%), and access (35.9%) than administrative support (33.3%) and teacher beliefs (15.6%) similar to the findings in my study. Access, which in turn is technical support, was a significant barrier. As the data in my study demonstrated, general technical support has a positive relationship with a teacher's stage of adoption. If these teachers had the proper support, this barrier would not exist, and a diffusion of technology into the classroom could occur. Francom also noted that teacher beliefs play a more significant role in larger school districts, as my study confirms.

Khlaif (2018) also found that general technical support and technical infrastructure in a school were significant factors in the adoption of technology, showing that it takes more than just having teachers with higher stages of adoption and making sure that technology is easy to use and useful; the types of supports administrations and districts put into place are critical in the success of teachers. This aligned with the study's findings and shows that administrators providing technical support is critical to the success of 1:1 device programs. My study also confirms and extends O'Neal et al. (2017), who examined teachers' beliefs about the role of technology in the classrooms. That study found that teachers noted the importance of technology but indicated that general technical support for devices was a barrier to doing so. As O'Neal et al. noted,

teachers felt they needed time to use and learn how to use devices as well as guidance in using them (O'Neal et al., 2017). My study showed that general technical support has a significant relationship with a teacher's stage of adoption. If general technical support were provided to teachers, such as in this focus group, more teachers would be functionally using 1:1 devices in the classroom for teaching and learning.

For *coaching technical support* in the ordinal logistic regression analysis, the predictor variable, *perceived coaching technical support*, contributed to the model. As a teacher perceives coaching technical support for 1:1 devices is available in their school, there is a negative relationship, showing a backward movement of 1.29% towards a lower stage of adoption.

Francom (2020) found training and technical support in the form of coaching to be a significant factor for 37.6% of teachers, which increased over that time when data was collected for a second round, unlike the findings in our study, which found that coaching technical has a negative relationship to a teacher's stage of adoption. Goh and Sigala (2020) found significance when administrators can pick their innovators and early adopters and assign these individuals as ambassadors, mentors, coaches, or given opportunities to ensure teachers are knowledgeable about the new technology (Goh & Sigala, 2020). However, the findings from my study contradict these findings. In contrast, my study found that, as a teacher perceives coaching technical support for 1:1 devices is available in their school, there is a negative relationship, showing a backward movement of 1.29% towards a lower stage of adoption. This leads to questions for future research on what type of coaching technical support was received and if the technical support was

effective. Goh and Sigala's conclusion aligns with the findings of Seif and Biranvand (2019), who posited that providing training to support teachers enables them to develop their skills and enhance their capabilities, increasing their willingness to adopt 1:1 technology in the classroom (Seif & Biranvand, 2019). By offering tailored support that addresses the unique needs of teachers, it is possible to foster a higher level of technology acceptance and promote greater use of 1:1 technology in the classroom. So, additional research is needed in this area to understand what types of coaching technical support are effective in increasing a teacher's stage of adoption.

Khlaif (2018), who looked at teachers' perceptions of mobile technology in K12, found that instructional support as coaching had a significant effect and that 40% of teachers noted this, which is contrary to my study's findings. Kalaif's findings indicated that it was in the area of ease of use and usefulness that coaching support was provided to ensure success in this area, which could be why there is a difference in findings (Khlaif, 2018). It is unknown if the types of coaching and instructional support play a role. In contrast, my participants found coaching technical support to have a negative relationship; it may not have been necessary to help them increase their stage of adoption or feel adequately supported in the classroom.

The findings of Durff and Carter (2019) showed that building a technology team comprised of administrators, technology support personnel, and teachers resulted in the most robust technology integration. In addition, they found that providing appropriate professional development, building support, and training teachers affects their use of technology (Durff & Carter, 2019). My study disagrees with these findings and, on the

contrary, shows a negative effect on coaching technology support. Durff and Carter noted their robust technology integration plan, which is unknown if the types of support this organization provided compared to the types of support found in New Jersey made a difference between the two findings.

By extending the current knowledge of 1:1 devices in the classroom and looking at how teachers' perceived ease of use, perceived usefulness, perceived organizational support, and perceived technical support play a role in their stage of adoption, we can understand how to support educators best and make recommendations around the significant factors. Educational institutions and districts need to plan to support teachers' ease of use of devices, finding them useful for teaching, providing clear organizational support, and having technical support for issues that arise to have a successful 1:1 integration in primary schools.

Theoretical Framework

My study's theoretical framework included the diffusion of innovation theory (Rogers, 2003) and the TAM (Davis, 1989). The following will show the interpretation of past studies by each theory.

Diffusion of Innovation

Rogers's diffusion of innovation theory explains how innovations become accepted in society and how individuals have adopted innovations over time. My study focused on innovation attributes and adopter characteristics to determine the adoption of 1:1 devices (Rogers, 2003). Contrary to my study, Chizwina and Mhakure (2018) found a mismatch between the beliefs and practices of mathematics teachers and their adoption of

technology. However, they also found that teachers who had a negative opinion on adopting technology and felt that it was incompatible influenced their classroom use. If teachers did not find the technology easy to use, as they could not, for example, easily write an equation using a technological tool, they rejected the technology (Chizwina & Mhakure, 2018). Chizwina and Mhakure's data contradicts the findings of my study that perceived ease of use and perceived usefulness are significant factors in a teacher's stage of adoption. My data showed that 31.2% of teachers in Stage 4: Adaptation to Other Contexts and 45.2% in Stage 5: Creative Application to New Contexts; therefore, 76.4% of teachers rated themselves in the highest two Stages of Adoption. This demonstrates that in New Jersey, most teachers who participated in the study fall into the higher half of the bell curve for Rogers's adopter categories. It is still unknown specifically if they were innovators and early adopters. It is also unknown if their school programs had an effect on their use of 1:1 devices in the classroom. As my study confirms, having such a large number of enthusiastic supporters of 1:1 devices in education can support future buy-in for teachers. With a larger amount of participants falling into the highest stages of adoption as it did in my study, it can change the opinions of teachers who fall into Rogers categories of the late majority or laggard categories supporting the diffusion of 1:1 devices throughout primary schools. The theory of the diffusion of innovations is a foundational theory used to explain how technology is adopted in an institution such as a school, and my study's findings confirm that when perceived ease of use, usefulness, organizational support, and general technology support have a positive relationship to a

teacher's stage of adoption. As there is a positive movement in these factors and the stage of adoption increases, 1:1 devices are diffused into the classroom by primary teachers.

Technology Acceptance Model

The TAM offers insights into the perceived ease of use and usefulness that may influence the individual's decision-making regarding the acceptance of new technology (Davis, 1989). Findings from my study suggest that teachers' adoption of 1:1 devices does have a positive relationship with their perceptions of the devices' usefulness and ease of use. Scherer et al. (2019) reviewed the relations within the TAM, examining how ease of use significantly predicted behavioral intentions and attitudes toward technology (Scherer et al., 2019). Their research is confirmed by my study's findings of the importance of teachers' perceptions of usefulness, ease of use, and attitudes toward user intentions. My study's findings implied a significant relationship between the perceived ease of use and perceived usefulness, as found in Camilleri et al. (2017), who explored how teachers "indicated that they were not extremely confident on how to use certain technologies in their lessons" (Camilleri et al., 2017, p.46). As the data confirms in my study, teachers need to find 1:1 devices that are easy to use and useful in the classroom. As my study found, when teachers find an innovation such as 1:1 devices easy to use and useful and that there was organizational support and general technology support, we see a positive relationship to their stage of adoption.

Henderson and Milman (2020) discussed how the TAM is important for both the teacher and the student because, for online learning, perceived ease of use and perceived usefulness are predictors of use (Henderson & Milman, 2020), which is confirmed by my

study when looking at 1:1 devices. When teachers found devices easy to use and useful, there was a positive movement in their stage of adoption. Warschauer et al. (2014) noted that the positive effects of technology are related to many factors, including the type of technology used and the technological support offered (Warschauer et al., 2014). My study also found that general technical support was a significant factor in teachers' stage of adoption. As a teacher was provided technical support, there was a positive relationship with a 13.76% movement towards a higher stage of adoption. Understanding the factors of the TAM and looking at the findings of my study, when primary teachers find 1:1 devices both useful and easy to use, their use is ubiquitous within the classroom setting.

Theoretical Framework Summary

Rogers's (2003) diffusion of innovation and Davis's (1989) TAM can explain and support findings that teacher technology acceptance at the primary level through the fundamental notion that technology will diffuse into schools based on teachers' perceptions and their relationship to their stage of adoption. The findings indicate that perceived usefulness contributed to the model. As a teacher finds 1:1 devices more useful, there is a positive relationship, showing a 14.79% movement toward a higher stage of adoption. The findings indicate that perceived ease of use contributed to the model. As a teacher finds 1:1 devices are perceived as easy to use, there is a positive relationship, showing a 27.47% movement toward a higher stage of adoption. The findings indicate that organizational support contributed to the model. As a teacher finds there is organizational support for 1:1 devices, there is a positive relationship, showing a

9.96% movement toward a higher stage of adoption. The findings indicate that perceived general technical support contributed to the model. As a teacher perceives technical support for 1:1 devices is available in their school, there is a positive relationship, showing a 13.76% movement toward a higher stage of adoption. The findings indicate that perceived coaching technical support contributed to the model. As a teacher perceives coaching technical support for 1:1 devices is available in their school, there is a negative relationship, showing a backward movement of 1.29% towards a lower stage of adoption.

These results provide an understanding that the perceived usefulness, ease of use, organizational support, and technical support have a relationship to a teacher's stage of adoption, and understanding and cultivating these perceptions have the ability to affect the way 1:1 devices are diffused into classrooms.

Limitations of the Study

Several limitations exist for my study. First, the generalizability of my study is limited because I only recruited primary teachers in New Jersey, and it is unknown if teachers in other areas would report the same perceptions. Another limitation of my study's generalizability is that it is unknown if the sample is representative of teachers in New Jersey. While demographic data was collected in the study, it is unknown how representative it is of the overall teachers in New Jersey because the New Jersey Department of Education lacks the appropriate demographic information; it only provides data on teachers' race and gender. Thus, it is not known if my study could be generalized or reproduced,

Another limitation of the study is due to inconsistencies in data collection. A technical issue necessitated recreating the survey in Google Forms, which inadvertently omitted a response option for the adoption stage. Specifically, the omission occurred for Stage 3 of the stages of adoption, which relates to understanding and applying the process. Consequently, it is unclear whether this omission impacted the study results, providing a potential issue that could have affected the study's reliability and validity. Additionally, it is also unknown if it is because teachers were enthusiastic supporters of technology or had a favorable view of technology and a positive view of a 1:1 device program may be more inclined to represent their experiences positively as proposed in Chapter 1, or if teachers who fall into the late majority or laggard category, who do not like the use of technology and do not support integrating 1:1 devices into classrooms, may share an opposing view but are more likely not to volunteer for the study (Rogers, 2003). The findings of my study also show that those who have a negative view of 1:1 devices may not have participated because only 11.8% of participants fell into the lowest two stages of adoption.

An additional limitation comes from violating Assumption IV of the Ordinal Logistic Regression Model, which is that the data must have proportional odds. The proportional odds were violated in RQ I, II, and one portion of RQ IV (for general technical support) due to the proportional odds being less than .05. As indicated in Laerd Statistics (2015), to check this violation would be by completing a binomial regression. Binomial regression cannot be completed because the variable is multinomial and has five categories. A multinomial regression could also be used instead, but the dependent

variable would lose its ordinal nature, which is vital to the study (Laerd Statistics, 2015). The data analysis was completed, understanding that this is a limitation of the study's validity.

Another limitation was collecting primary data in the form of surveys that included recruiting participants. It took four months and several reminder e-mails to obtain 93 participants in the study. While I did meet the necessary number of participants to conduct the data, reliability may be an issue due to the fact that it is possible that teachers interested in technology in the classroom or positively perceived technology were more likely to volunteer for the study. I found that 31.2% of teachers in Stage 4: Adaptation to Other Contexts and 45.2% in Stage 5: Creative Application to New Contexts; therefore, 76.4% of teachers rated themselves in the highest two Stages of Adoption. These results show a much larger trend of responses to the higher levels, showing perceptions may have caused teachers to choose to participate in the study affecting reliability as well as to factor into issues for generalizability. Another limitation that may reflect why many teachers found themselves in the highest two stages of adoption could be 1:1 technology use during the COVID-19 pandemic. During this time, teachers in New Jersey transitioned into a remote learning format where every student had a 1:1 device. Teachers were leading lessons virtually and had to learn and expand upon their current knowledge to be successful, which may account for the higher stages of adoption of teachers from New Jersey.

Recommendations

While the study results found that 76.4% of participants fell into higher Stages of Adoption, looking more closely at Adopter Categories and demographics may provide critical information. Cirus and Simonova's (2020) findings indicated that innovators, early adopters, and the early majority are relatively close to each other when adopting technology. The late majority and laggards are very close in their perceptions of rejecting technology. Still, it was found that most of the teachers in this group were older and had more experience (Cirus & Simonova, 2020). Therefore, A recommendation for future research to examine specific demographics and Stages of Adoption could provide further insight into the high rate of adoption seen of 1:1 devices in my study. Another recommendation for a future study could be a study attempting to include a balanced number of participants at all stages of adoption. This would allow the researcher to compare participants' responses across various conditions, improving internal validity because all stages would be evenly represented.

A recommendation for future research from the findings would be to examine if the COVID-19 pandemic shaped teachers' use, adoption, and acceptance of 1:1 devices in the classroom. Findings from my study indicate that of teachers who participated, the majority fell into the two highest adopter categories. While this could result from potential limitations due to teachers' positive views and greater willingness to take the survey, it may also show how consistent use of 1:1 devices since COVID has changed teachers' adoption and acceptance of these devices within the classroom.

Another recommendation for future research from the findings would be to examine how coaching and professional development have a relationship to teachers' technology acceptance. My study found that perceived coaching technical support had a negative relationship with their stage of adoption. It would be important for future research to understand the types of coaching support that are effective in supporting a teacher's stage of adoption and which push teachers away from utilization. In addition to understanding best practices for educational technology coaching and support around 1:1 device use. Overall, while the findings of my study contradict past studies, there are still many unanswered questions in the field when it comes to coaching technology support. Every organization, as seen through the research, has different ways to support teachers, and many of those methods fall under the support of coaching technology. While some organizations offer mentors, some offer robust professional development, and some offer coaches, the effectiveness of one or more of these areas is unknown. How much of a role they play, as well as the unknown exact type of coaching New Jersey primary teachers receive, caused a significant negative relationship between coaching technology support and the stage of adoption.

When considering the findings of my study, although the amount of participants needed to conduct research was met, the sample size was still small. Additional research is recommended on primary teachers' perceived ease of use, usefulness, and technical support due to the proportional odds assumption of the ordinal logistic regression being unmet for RQ I, RQ II, and part of RQ IV. A larger scale study may have enough

participants to meet the proportional odds in those categories as the study size has been known to affect the outcome of proportional odds.

Implications

The results of my study may be beneficial in creating positive social change in the following ways. The findings can help schools understand factors that might contribute to a teacher's Stage of Adoption of technology, which might affect 1:1 device use in the classroom. Findings indicate that perceived usefulness was significant with a positive relationship to the stage of adoption. The findings indicate that perceived ease of use was significant with a positive relationship to the stage of adoption. The findings indicate that perceived organizational support was significant with a positive relationship to the stage of adoption. Findings indicate that perceived general technical support was significant with a positive relationship to the stage of adoption. The findings indicate that perceived coaching support was significant with a negative relationship to the stage of adoption.

Due to these factors being significant, schools and districts may want to be aware of innovations that affect teacher perceptions and that teachers should always be considered stakeholders in these types of initiatives. Another implication of perceived coaching technology support causing a negative movement is the quality of the coaching and support provided. Questions that should be thought about by educational organizations are: Is coaching or professional development effective? How do you know? Do teachers feel it is necessary? Does it target areas teachers feel they need support in? All these questions can also fuel future research. Still, educational organizations should

be aware that the type of coaching support can have a negative relationship with teachers' use of 1:1 devices in the classroom.

The study could provide the groundwork for school districts to adopt an effective technology plan to support the teachers. This study demonstrates that school districts and educational institutions need to look at creating technology plans and make well-rounded plans with key stakeholders to ensure proper support for teachers. Not only was perceived ease of use and usefulness statistically significant, but organizational support and general technical support were statistically significant and caused a positive movement in a teacher's stage of adoption. Therefore, it is essential for educational institutions to continue these efforts in supporting teachers. District-level decision-makers can incorporate these results to help encourage future adoption (Holen et al., 2017; Scherer et al., 2019). Knowing that teachers' perceived ease of use and usefulness have a positive relationship with their stage of adoption, a district can ensure the devices they purchase to fit their teachers and students, not to affect these perceptions.

My study's findings fit with the current theoretical frameworks. Rogers's (2003) theory of diffusion of innovations addressed how individuals adopted and utilized technology based on their experiences. Rogers's (2003) theory stipulated that when an innovation is available, individuals will respond to it with different levels of acceptance and enthusiasm. As my study's findings indicate, understanding a teacher's willingness to adopt an innovation can also be based on their perceptions. At the same time, the second part of the framework, TAM, examined reasoned actions based on perceived technology

usefulness and ease of use (Davis, 1989), which were both found to be statistically significant factors in a teacher's stage of adoption.

Technology is ubiquitous in our society; therefore, understanding the significance of my study's implications is vital. Looking at the ever-changing role of teachers, it is vital for institutions to strive to promote technology acceptance and provide a means of supporting educators around these key factors so that more teachers will use 1:1 devices in the classroom. The more a teacher feels 1:1 devices are useful and easy to use, and they are provided with organizational and technical support, their stage of adoption sees a positive movement toward teachers being in stage 5, where they use 1:1 devices for creative applications to new contexts. A recommendation for practice would be to ensure at the school or district level that programs and policies put into place understand the intricacies around how a 1:1 device's ease of use and usefulness affects a teacher's adoption into the classroom. In addition, this should also apply to any programs that teachers must utilize on these devices. If teachers do not find them useful and easy to use, it will hinder their adoption into classroom activities, thus affecting the quality of education a student may receive. Therefore, teachers must understand how to use technology and programs that a school or district may mandate for instruction to ensure that they are useful and easy for a teacher to use and implement in the classroom.

Furthermore, schools and districts must look to have teachers, especially those who fall into Rogers (2003) innovators or early adopters and those at the highest end of the stage of adoption, teachers who adapt technology to other contexts, and those who use technology in the creative application to new contexts. Bringing these types of teachers in

to support decision-making can help mitigate possible future issues around 1:1 devices and educational technology. In addition, if a new device or program is mandated, ensuring proper training of teachers, as well as understanding why this change is needed and how it will help make the teachers' job easier, can help to sustain teachers' perceived usefulness and ease of use.

Conclusion

The problem my study addressed was that it is not known whether the relationship between New Jersey primary school teachers' technology acceptance of a 1:1 device program and their perceived usefulness, ease of use, organizational support, and technical support impacts their reported stage of adoption (see Alizadehjamal & Keyhan, 2021; Bergström & Wiklund-Engblom, 2022; Francom, 2020; Hallman, 2019; Harper & Milman, 2016; Khlaif, 2018; Regan et al., 2019; Ross, 2020; Solomon, 2017; Tondeur et al., 2017; Xu & Zhu, 2020). The study's findings determined a statistically significant relationship between New Jersey primary teachers' perceived usefulness, ease of use, organizational support, general technical support, and coaching technical support and their stage of adoption.

Understanding teachers' perceptions is essential when building buy-in for any initiative, especially around the use of educational technology in the classroom. Over the last two decades, educational technology in the classroom has allowed for shifting practices around teaching and learning. Technology shapes the classroom and impacts the role of the teacher. Without understanding teachers' perceptions, a district or school would be unable to support teachers in providing the best outcomes for students properly.

With research mostly focusing on high school and collegiate education, my study provides a unique lens into the perceptions of primary educators.

In conclusion, while my study had limitations, the findings confirmed that a 1:1 device's perceived usefulness and ease of use were statistically significant factors in the stage of adoption of technology in the classroom. Furthermore, participants confirmed that perceived organizational support and perceived general technical support were statistically significant factors in their stage of adoption of technology in the classroom. Findings also indicated that coaching technical support was significant but had a negative impact on a teacher's stage of adoption, which leaves questions for future research as to why. As a school supports educators by utilizing technology that a teacher finds useful and easy to use, teachers will have a higher stage of adoption, which correlates to their use of innovative technology such as 1:1 devices in the classroom. Future research can look at the types of technological support and what teachers find is essential. With coaching technical support, future research can dig deeper into the effects of coaching and whether coaching is effective in supporting teachers by meeting their needs. Future research can also build on my study to focus on other areas and issues, including building an understanding of what supports teachers' perceived usefulness and ease of use of 1:1 devices to fully understand the intricacies of buy-in for these programs to solidify the use in classroom activities from the primary teachers' lens.

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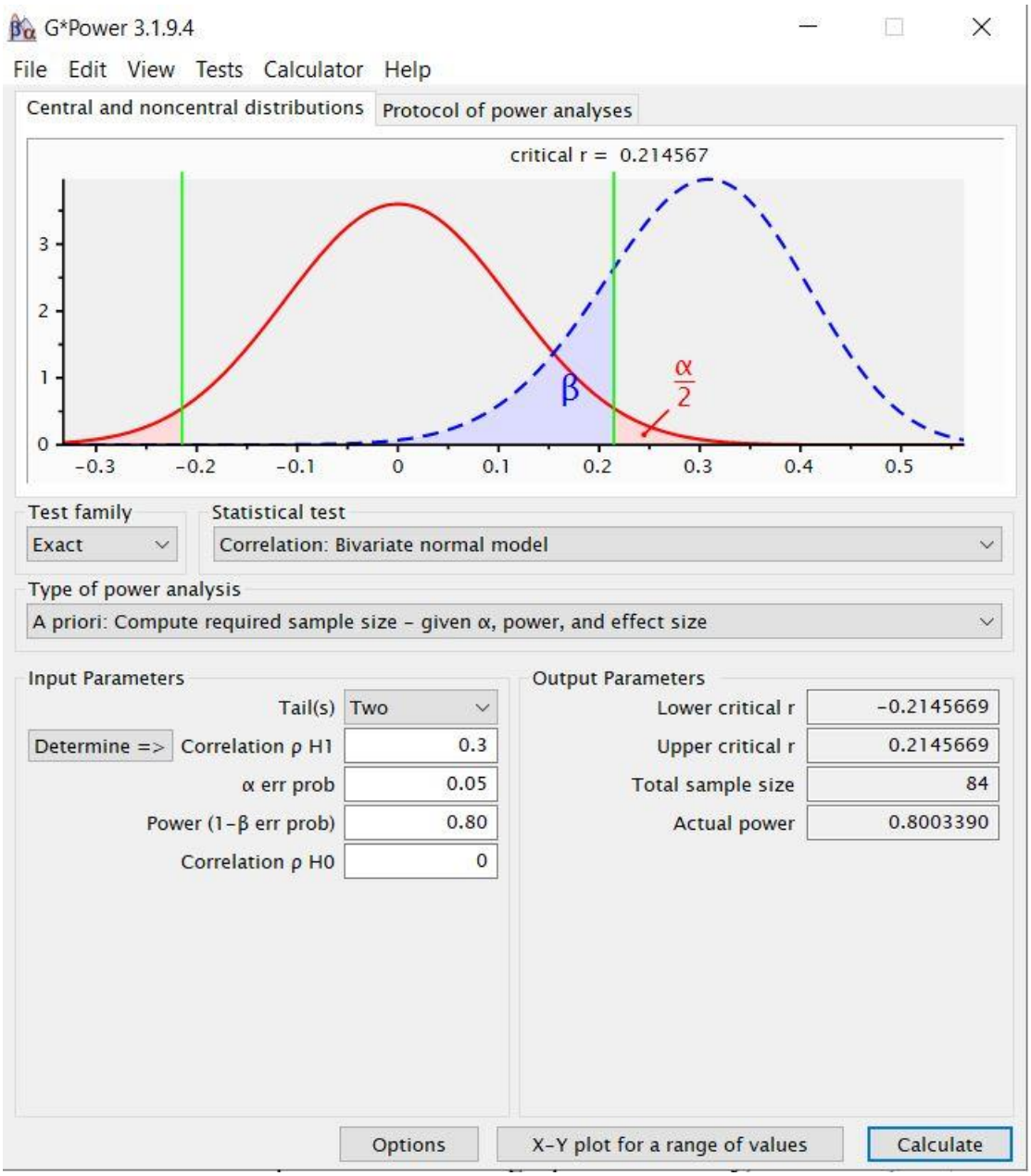
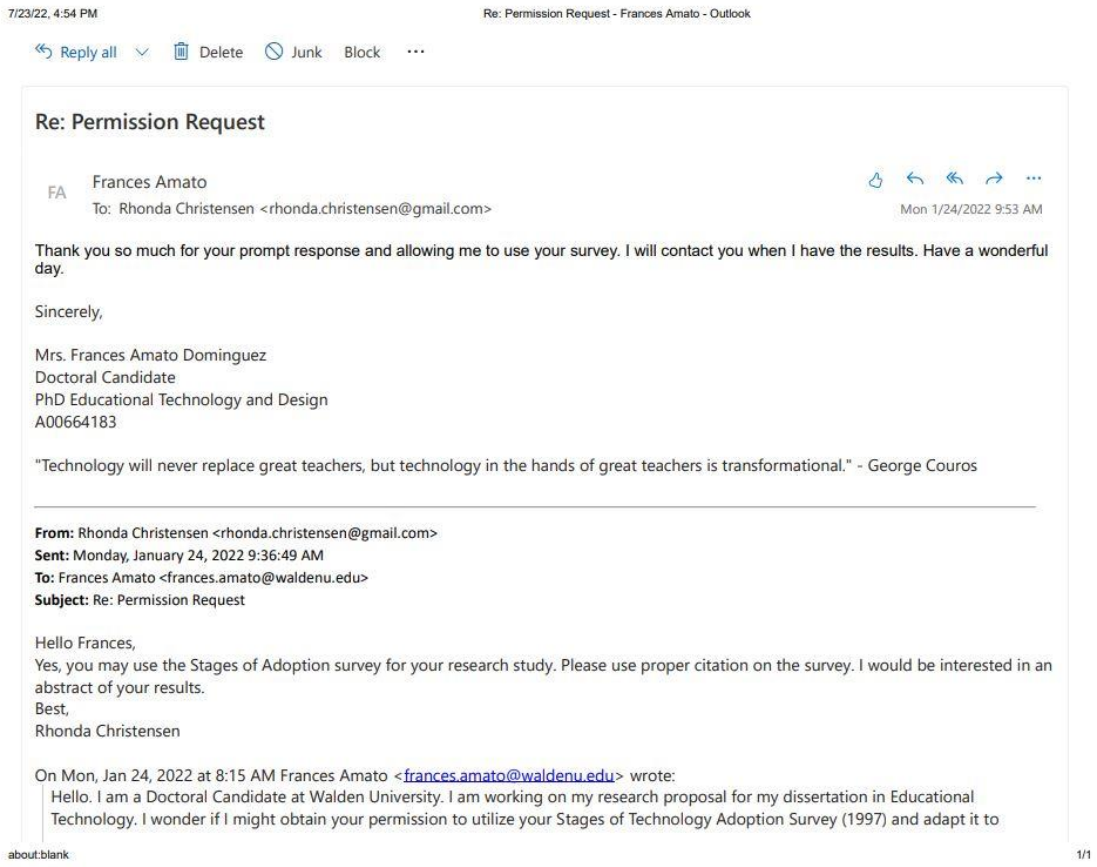
Appendix A: G*Power Analysis



Appendix B: Letters of Permission

Letter of Permission B1



7/23/22, 4:54 PM Re: Permission Request - Frances Amato - Outlook

Reply all | Delete | Junk | Block | ...

Re: Permission Request

FA Frances Amato
To: Rhonda Christensen <rhonda.christensen@gmail.com>
Mon 1/24/2022 9:53 AM

Thank you so much for your prompt response and allowing me to use your survey. I will contact you when I have the results. Have a wonderful day.

Sincerely,

Mrs. Frances Amato Dominguez
Doctoral Candidate
PhD Educational Technology and Design
A00664183

"Technology will never replace great teachers, but technology in the hands of great teachers is transformational." - George Couros

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From: Rhonda Christensen <rhonda.christensen@gmail.com>
Sent: Monday, January 24, 2022 9:36:49 AM
To: Frances Amato <frances.amato@waldenu.edu>
Subject: Re: Permission Request

Hello Frances,
Yes, you may use the Stages of Adoption survey for your research study. Please use proper citation on the survey. I would be interested in an abstract of your results.
Best,
Rhonda Christensen

On Mon, Jan 24, 2022 at 8:15 AM Frances Amato <frances.amato@waldenu.edu> wrote:
> Hello. I am a Doctoral Candidate at Walden University. I am working on my research proposal for my dissertation in Educational Technology. I wonder if I might obtain your permission to utilize your Stages of Technology Adoption Survey (1997) and adapt it to

about:blank 1/1

Letter of Permission B2

Question concerning utilization ofFLT-TTQ

Frances Amato <frances.amato@waldenu.edu>
Sat 7/23/2022 5:33 PM
To: Frances Amato <frances.amato@waldenu.edu>

From: Frances Amato <frances.amato@waldenu.edu>
Sent: Saturday, July 23, 2022 5:23 PM
To: Frances Amato <frances.amato@waldenu.edu>
Subject: Fw: Question concerning utilization ofFLT-TTQ

From: Jack Daniel Strahl (jstrahl) <jstrahl@memphis.edu>
Sent: Monday, April 25, 2022 2:06:20 PM
To: Frances Amato <frances.amato@waldenu.edu>
Cc: Cindy A Muzzi (clencke) <clencke@memphis.edu>
Subject: Re: Question concerning utilization ofFLT-TTQ

Dear Frances,

Unfortunately, we do not have an updated survey currently. However, given your situation, we will allow you to use the old survey. Please keep in mind that we only allow it for your dissertation, and no other use.

Thanks,

J. Dan Strahl
Associate Director
Center for Research in Educational Policy
901.678.4157

The University of Memphis
301 Newport Hall
Memphis, TN 38152

Toll Free: 866.670.6147 Main: 901.678.2310
Fax: 901.678.4257 | memphis.edu/crep

From: Frances Amato <frances.amato@waldenu.edu>
Sent: Monday, April 25, 2022 12:19 PM
To: Jack Daniel Strahl (jstrahl) <jstrahl@memphis.edu>
Cc: Cindy A Muzzi (clencke) <clencke@memphis.edu>
Subject: Re: Question concerning utilization ofFLT-TTQ

To whom it may concern,

Hello. I spoke with my dissertation chair and methodologist concerning my proposal. They suggested I contact you again and ask if you have an updated survey. My study relies on the FLT-TTQ and couldn't be completed without the tool. I am hoping that you have an updated tool that is similar in nature available or a tool that may be able to support the dissertation. Thank you in advance for your time and support.

Sincerely,

Mrs. Frances Amato Dominguez
Doctoral Candidate
PhD Educational Technology and Design
A00664183

"Technology will never replace great teachers, but technology in the hands of great teachers is transformational." - George Couros

From: Cindy A Muzzi (clencke) <clencke@memphis.edu>
Sent: Monday, April 11, 2022 10:59:43 AM
To: Frances Amato <frances.amato@waldenu.edu>
Cc: Jack Daniel Strahl (jstrahl) <jstrahl@memphis.edu>
Subject: RE: Question concerning utilization ofFLT-TTQ

From: Frances Amato <frances.amato@waldenu.edu>
Sent: Friday, April 8, 2022 11:53 AM
To: COE CREP <coe_crep@memphis.edu>
Subject: Question concerning utilization ofFLT-TTQ

Hello. I am a Doctoral Candidate at Walden University. I am working on my research proposal for my dissertation in Educational Technology. I wonder if I might obtain your permission to utilize your Freedom to Learn Teacher Technology Questionnaire (FLT-TTQ) and adapt it to replace generalized references to specifically address educators' adoption of 1:1 technology into classroom activities. Thank you for your time and consideration.

Sincerely,

Ms. Frances Amato
Ph.D. Educational Technology and Design
A00664183
1-917-859-9907
Frances.Amato@Waldenu.edu

Appendix C: Original Instruments

Survey Instrument 1

Stages of Adoption of Technology Survey (SA) (Christensen, 1997).

Gender: _____ Age: ____ Years of teaching experience: _____

Highest degree received:_____ Level taught:_____

Location:_____

Do you have a computer at home?_____

Access to the World Wide Web at home? _____

Please read the descriptions of each of the levels of use of technology. Choose the stage that best describes your level.

Stage 1: Awareness. I am aware that technology exists but have not used it – perhaps I'm even avoiding it.

Stage 2: Learning the process. I am currently trying to learn the basics. I am often frustrated using computers. I lack confidence when using computers.

Stage 3: Understanding and application of the process. I am beginning to understand the process of using technology and can think of specific tasks in which it might be useful.

Stage 4: Familiarity and confidence. I am gaining a sense of confidence in using the computer for specific tasks. I am starting to feel comfortable using the computer.

Stage 5: Adaptation to other contexts. I think about the computer as a tool to help me and am no longer concerned about it as a technology. I can use it in many applications and as an instructional aid.

Stage 6: Creative application to new contexts. I can apply what I know about technology in the classroom. I am able to use it as an instructional tool and integrate it into the curriculum.

Survey Instrument 2

Freedom to Learn Teacher Technology Questionnaire (FL-TTQ)

Below are the statements to which respondents replied on a Likert-type scale ranging from (1) Strongly disagree to (5) Strongly agree (Donovan & Green, 2010).

Impact on Classroom Instruction

My teaching is more student-centered when FTL laptops are integrated into the lessons.

I routinely integrate the use of FTL laptops into my instruction.

The FTL laptop program has changed classroom learning activities in a very positive way.

My teaching is more interactive when the FTL laptops are integrated into the lessons.

Impact on Students

The use of FTL laptops has increased the level of student interaction and/or collaboration.

The integration of the FTL laptops has positively impacted student learning and achievement.

Most of my students can capably use the FTL laptops at an age-appropriate level.

The use of the FTL laptops has improved the quality of student work.

Teacher Readiness to Integrate Technology

I know how to meaningfully integrate the laptops into lessons.

I am able to align use of the FTL laptops with my district's standards-based curriculum.

I have received adequate training to incorporate the FTL laptops into my instruction.

My computer skills are adequate to conduct classes that have students using the FTL laptops.

Overall Support for Technology in the School

Parents/Caregivers and community members support our school's FTL program.

Teachers receive adequate administrative support to integrate the FTL laptops into classroom practices.

Our school has a well-developed technology plan that guides all technology integration efforts.

The FTL teachers in this school are generally supportive of the FTL laptop program.

Technical Support Most of our FTL laptops are kept in good working condition.

I can readily obtain answers to technology-related questions.

My students have adequate access to up-to-date technology resources.

Materials (e.g., software, printer supplies) for classroom use of the FTL laptops are readily available.

Lead Teacher Effectiveness

I have frequently participated in professional development that was planned by or provided by my Lead Teacher and/or Super Coach.

I more frequently integrate technology into my instruction as a result of participating in professional development planned or provided by my Lead Teacher and/or Super Coach.

The quality of my technology integration lessons has improved as a result of participating in professional development planned or provided by my Lead Teacher and/or Super Coach.

Overall, my Lead Teacher has been a valuable asset to our school's FTL laptop program.

Appendix D: Instrumentation

Hello. Thank you for clicking the link to take this survey. This survey has been sent to you as part of dissertation research being performed by a fellow teacher and Walden University doctoral student, Frances Amato. This survey will take around five to ten minutes to complete. The research looks at teachers' technology acceptance and their use of 1:1 technology-based activities as part of classroom activities. Your participation in this survey is voluntary and has no risks. Potential benefits may be the identification of interventions that could positively impact 1:1 technology use in classroom activities as well as supports for teachers in adopting 1:1 technology in the classroom. The information you provide will be kept confidential; all names of districts, schools, and individuals who participate in this research will be withheld from published reports. You may discontinue participation at any time. If you decide to discontinue, any information you provided will be immediately destroyed. If you have questions about the study, please contact the researcher via email: frances.amato@waldenu.edu. By going forward in this survey, you are providing consent for the researcher to use your responses for the purposes of this study. To view the informed consent, please click here https://bit.ly/3opqSLv. Thank you again for your assistance!

1. Will you participate in the survey?

   Yes.

   No, I'm opting out.

   Condition: No, I'm opting out. Is Selected. Skip To: End of Survey

2. What is your gender?

Male

Female

Prefer not to say.

3. How old are you?

20 - 29

30 - 39

40 - 49

50 - 59

60 - 69

70 +

4. In your role as teacher, how many cumulative years of teaching experience do you have?

Less than 1 year

1 - 4 years

5 - 10 years

11 - 20 years

21+ years

5. In your role as a teacher, how many years have you taught at your present school?

   Less than 1 year

   1 - 4 years

   5 - 10 years

   11 - 20 years

   21+ years

6. What is your highest level of education completed?

   Bachelor's degree

   Master's degree

   +30, Second master's or Specialist's degree

   Doctoral degree

7. What subject(s) do you currently teach? (Please check all that apply.)

   Special Education Classroom Teacher

   Regular Education Classroom Teacher

   Mathematics

   English Language Arts

   Social Studies

   Science

   STEM/STEAM

   Music

Art

World Languages

Physical Education/Wellness

8. What courses do you currently teach? (Please check all that apply.)

Remedial

Special Education

General Education

Honors

Other

9. What Grade level(s) do you currently teach? (Please check all that apply.)

Pre-K

K

1

2

3

4

5

6

7

8

10. Do you have a computer at home?

Yes

No

11. Do you have access to the Internet at home?

Yes

No

12. Please think about student use of 1:1 technology during classroom learning activities as you respond to the following survey questions, with 1:1 technology referring to each student having a mobile computing device such as a Chromebook, laptop, iPad, or tablet.

From the statements below, please select the option that best describes your current use of 1:1 technology-based learning activities to your students during class.

A great deal

A lot

A moderate amount

A little

None at all

13. How do your students obtain 1:1 technology for use during your class? (Please check all that apply.)

Students bring their self-owned devices to class.

Students bring school-issued devices to class.

Students use a device from my classroom's set.

14. In a typical week, how often do you assign 1:1 technology-based learning activities during class?

Daily

3 - 4 times a week

1 - 2 times a week

1 - 2 times a month

Less than once per month

15. In a typical week, what portion of a class period do you allot for students to spend on 1:1 technology-based learning activities? *

all or most

about 3/4

about 1/2

about 1/4

Very little or none

16. From the statements below, please select the option that best describes your current practice in assigning 1:1 technology-based learning activities to your students during class.

- I am aware that it is available for students to use, but I have not required it.
- I am currently trying to learn the basics of having students use it. I am often frustrated and/or lack confidence when creating 1:1 technology-based activities for my students.
- I am gaining a sense of confidence about incorporating it. I am starting to feel comfortable with its use.
- I think of it as a tool to help me and I am no longer concerned about it as technology. I can plan for students to use their 1:1 technology in many applications and as instructional aids.
- I can apply what I know about it in the classroom. I can easily employ 1:1 technology-based student activities during class as instructional tools, and I fully integrate 1:1 technology-based activities into classroom curriculum.

17. Please indicate your level of agreement with the following statements in regard to the impact of 1:1 technology-based activities on your instruction.

	Strongly Agree	Somewhat Agree	Neither Agree nor Disagree	Somewhat Disagree	Disagree
a. My teaching is more student--					

centered when 1:1 devices are integrated into the lessons.					
b. I routinely integrate the use of 1:1 devices into my instruction.					
c. It has changed classroom learning activities in a positive					
d. My teaching is more interactive when the 1:1 laptops are integrated into the lessons.					

18. Please indicate your level of agreement with the following statements in regard to the impact of 1:1 technology-based activities on your students.

	Strongly Agree	Somewhat Agree	Neither Agree nor Disagree	Somewhat Disagree	Disagree
a. It has increased the level of student interaction and/or collaboration.					
b. It has positively impacted student learning and achievement.					
c. Most of my students can capably use 1:1 technology at an age-appropriate level					
d. It has improved the quality of student work					

19. Please indicate your level of agreement with the following statements in regard to your ability to integrate 1:1 technology use into your classroom lessons.

	Strongly Agree	Somewhat Agree	Neither Agree nor Disagree	Somewhat Disagree	Disagree

a. I know how to meaningfully integrate the its use into my lessons.					
b. I am able to align its use with my district's curriculum.					
c. I have received adequate training to incorporate it into my instruction.					
d. My computer skills are adequate to conduct classes involving it.					

20. Please indicate your level of agreement with the following statements in regard to overall organizational support for 1:1 technology-based class activities.

	Strongly Agree	Somewhat Agree	Neither Agree nor Disagree	Somewhat Disagree	Disagree
a. Parents/Caregivers support our school's 1:1 technology program.					
b. Community members support our school's 1:1 technology program.					
c. Teachers receive adequate administrative support to integrate 1:1 technology in classroom practices.					
d. Our school has a well-developed technology plan that guides all technology integration efforts.					
e. The teachers in this school are generally					

supportive of the 1:1 technology program.					

21. Please indicate your level of agreement with the following statements in regard to the impact of technical support.

	Strongly Agree	Somewhat Agree	Neither Agree nor Disagree	Somewhat Disagree	Disagree
a. Most of our 1:1 devices are kept in good working conditions.					
b. I can readily obtain answers to technology--related questions.					
c. My students have adequate access to up-to-date technology resources.					
d. Materials (e.g. software, printer, supplies) for classroom use of the devices are readily available.					

22. Please indicate your level of agreement with the following statements concerning 1:1 technology use in classroom activities.

	Strongly Agree	Somewhat Agree	Neither Agree nor Disagree	Somewhat Disagree	Disagree
I feel it is a verry useful teaching tool.					

I feel that it is easy to use as a teaching tool.					

23. Please indicate your level of agreement with the following statements in regard to the impact of professional development and technical support on 1:1 technology-based activities.

	Strongly Agree	Somewhat Agree	Neither Agree nor Disagree	Somewhat Disagree	Disagree
a. I have frequently participated in professional development that was planned by or provided by a Lead Teacher and/or Coach.					
b. I more frequently integrate technology into my instruction as a result of participating in professional development planned or provided by a Lead Teacher and/or Coach.					
c. The quality of my technology integration lessons has improved as a result of participating in professional development planned or provided by a Lead teacher and/or Coach.					
d. Overall, the Lead Teacher or coach has been a valuable asset to our school's program.					

Appendix E: Participant Invitation Letter

Subject line:

Your insight into 1:1 technology use as a NJ primary teacher

Email message:

There is a new study about the perceptions of primary teachers who are using or have used 1:1 technology for classroom instruction. You are invited to complete a 10-minute anonymous survey.

Seeking volunteers that meet these requirements:

· Be a teacher in New Jersey.

· Be a teacher in primary grades (Kindergarten through 8th grade)

· Currently use or have used 1:1 technology for teaching.

This survey is part of the doctoral study for Frances Amato, a Ph.D. student at Walden University.

Please click here to view the consent form and begin the survey if you are interested in participating. You are welcome to forward it to other primary teachers in New Jersey who might be interested, or they may contact me at frances.amato@waldenu.edu. Thank you.

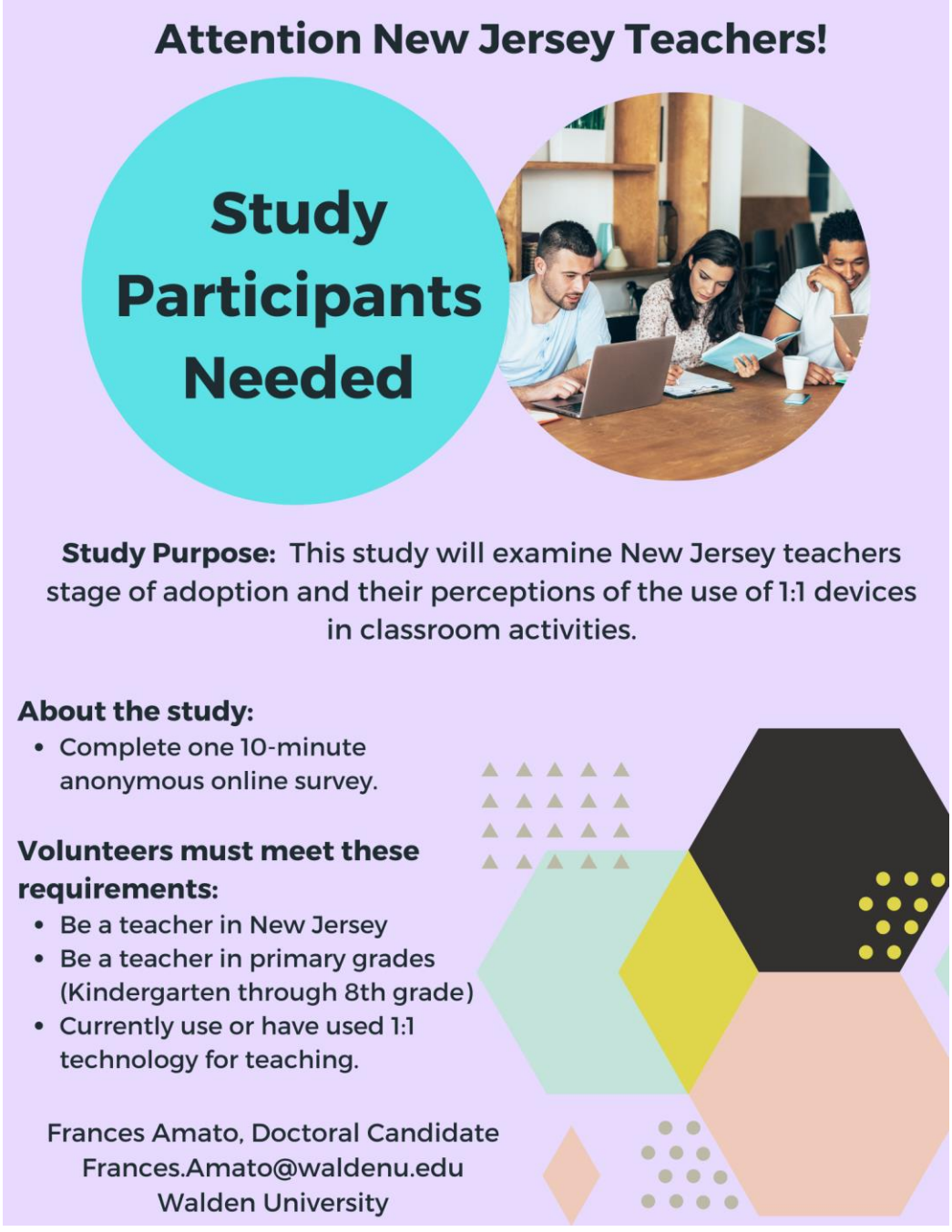
Appendix G: Facebook Group Administrator Posting Consent

Direct message:

Hello. I see that you are one of the administrators of the Facebook group (Group Name). I am a member of that page, and I am working on my dissertation study about the perceptions of teachers who are using or have used 1:1 technology for classroom instruction. The study examines the relationship between teachers' level of technology acceptance and factors they perceive to affect their acceptance of 1:1 technology in the classroom. Would it be okay to post a message and infographic to the group about looking for participants for my research study to complete a short survey on factors affecting their technology acceptance? Thank you in advance for your time.

Frances Amato

Appendix H: Social Media Infographic and Recruitment Message



Hello. There is a new study about the perceptions of primary teachers who are using or have used 1:1 technology for classroom instruction. You are invited to complete a 10-minute anonymous survey.

Seeking volunteers that meet these requirements:

· Be a teacher in New Jersey.

· Be a teacher in primary grades (Kindergarten through 8th grade)

· Currently use or have used 1:1 technology for teaching.

This survey is part of the doctoral study for Frances Amato, a Ph.D. student at Walden University. Please click here (https://forms.gle/MKWPyWLJN3BiZcHg7) to view the consent form and begin the survey if you are interested in participating. You are welcome to forward it to other primary teachers in New Jersey who might be interested, or they may contact me at frances.amato@waldenu.edu. Thank you.