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Elementary Special Education Teachers' Perception on Technology Adoption in the Shift to Online Learning

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Walden University
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Abstract

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EdS, Walden University, 2019

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Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Abstract

Elementary special education teachers are required to provide online learning instruction to students with disabilities as schools are navigating through the COVID -19 pandemic with a lack of information as to how to do so successfully. The purpose of this basic qualitative study was to explore the perceptions of elementary special education teachers in a school district in the southeastern United States on their pedagogical and technology concerns regarding the shift to online learning for students with disabilities. This study's conceptual framework was based on Roger's diffusion theory and concerns-based adoption model. The research questions addressed elementary special education teachers' perceptions of the challenges of implementing online learning for students with disabilities as well as their pedagogical and technological concerns. The elementary special education teachers were chosen using purposeful sampling based on whether they currently or previously taught students with disabilities online. Data were collected from 10 elementary special education teachers using semi-structured interviews. The interviews were recorded, transcribed, and analyzed thematically. The key findings revealed how elementary special education teachers adapted their instruction online; how training for teachers and parents is required for successful online learning; and how challenges in the online environment, such as self-regulation, and lack of proper guidance impacts the learning of students with disabilities. This study could lead to positive social change through providing school leaders with insight into the perspectives of elementary special education teachers, allowing leaders to offer more relevant, targeted training and resources for delivering online instruction to students with disabilities.

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Dedication

This study is dedicated to those who are and have been underdogs that have taken their own paths, followed their instincts, and made sacrifices to be the best version of themselves. Robert Frost said it best, “Two roads diverged in a wood, and I – I took the one less traveled, and that has made all the difference.” In that light, to my underdogs, I am sharing the words to you that were spoken to me in 8th grade. I believe in you when you do not believe in yourself, and I have faith in you when you do not have faith in yourself. When you start believing and having faith in yourself, I will still believe and have faith in you.

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I would like to acknowledge Dr. Courduff, the best mentor anyone could have. Thank you for your encouragement throughout this journey. Words cannot express the impact you've had on my life and the completion of this journey. I would like to acknowledge Dr. Jayasena. Thank you for providing insightful feedback and attention to detail. I would like to acknowledge Dr. McGrew for his assistance as the University Research Reviewer (URR) and his prompt feedback. I want to express my gratitude to and acknowledge my family. My mother is of my biggest supporters. I want to thank all my friends and peers who took the time to motivate me to keep going when things got difficult along the way.

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Chapter 1: Introduction to the Study

Due to the COVID-19 pandemic in 2020, schools shifted from in-person instruction to online learning. There is currently minimal information about elementary special education teachers providing online instruction to students with disabilities during the transition period from in-person instruction to online learning (Supratiwi et al., 2021; Trust and Whalen, 2021). As a result, an investigation into elementary special education teachers' perceptions of the technology adoption in the shift from in-person to online learning was significantly important. Despite their teacher training focusing primarily on in-person instruction only, teachers provided the best online instruction to students with disabilities (Allen et al., 2020; Cavanaugh and DeWeese, 2020). This study can promote positive social change by providing school leaders with the perspectives of elementary special education teachers to assist in developing more useful, relevant, and targeted training for delivering online instruction to students with disabilities.

In the first chapter, I describe the study in detail. The problem statement, purpose, research questions, and the conceptual framework comprised of Roger's theory of diffusion and the concerns-based adoption model (CBAM) are discussed. I also provide the definitions, assumptions, scope and delimitations, limitations, and significance of the study to social change.

Background

The COVID-19 pandemic compelled schools to rethink how to provide students with online instruction. At the beginning of the COVID-19 pandemic, teachers shifted their duties and responsibilities from the classroom to primarily online instruction

without proper training (Cavanaugh and DeWeese, 2020). Teachers were unprepared to use online strategies and tools and had difficulty adapting their pedagogy to online environments and desired more technology training (Trust and Whalen, 2020). Special education teachers lack adequate technical training for online instruction and require professional development to address and improve their abilities to teach students with disabilities online (Anderson and Putman, 2020; Cagiltay et al., 2019; Sabayleh and Alramamneh, 2020; Smith, 2020). The resulting practice gap is that special education teachers are insufficiently prepared to provide online instruction to students with disabilities. Therefore, with this study I intended to identify the areas where elementary special education teachers feel they need more training.

Problem Statement

The problem addressed through this study elementary special education teachers are required to provide online learning instruction to students with disabilities as schools are navigating through the COVID -19 pandemic with a lack of information as to how to do so successfully. Some schools were not adequately prepared to deliver online learning instruction to students with disabilities as they transitioned to online learning instruction (Catalano et al., 2021; Crouse et al., 2018; Long et al.,2021; Steed and Leech, 2021; Supratiwi et al., 2021; Thomas et al., 2019; Tindle et al., 2017). Therefore, it was essential to understand elementary special education teachers' perceptions of their pedagogical and technological concerns to understand the areas in which they need more training. Furthermore, special education teachers believe they are better prepared to teach

students with disabilities using the traditional method rather than the online learning approach (Crouse et al., 2018).

The local school district—which is the study site for this study serves as an example of the larger national problem—decided in July 2019 to give parents the choice of face to face or online learning for their children. Teachers in Grades K–12 received training on delivering online instruction to their students. During training, teachers were shown how to conduct online learning using Google Meets or Zoom. However, the training was not designed with special education in mind, and the school district did not provide special education teachers with formal training or knowledge to teach students with disabilities online. There was no mention of using technology to address modifications and accommodations required to teach students with disabilities. Special education teachers believed that they were not meeting the modifications and accommodations listed in the students' Individualized Education Program or 504 plans through online instruction. Researchers found that special education teachers lack technology training and resources for using online learning to teach students with disabilities (Allen et al., 2020; Alshamri, 2021; Anderson and Putman, 2020; Cavanaugh and DeWeese, 2020; Smith, 2020).

Following the first month of school in fall 2020, the school district superintendent announced 2 virtual days for all K–12 teachers to receive additional training. Even with this additional training, there was yet no mention of using technology to meet the needs of students with disabilities despite it being evident that special education teachers

require more training and resources to aid in the adoption of technology to better serve students with disabilities (see Crouse et al., 2018; Parmigiani et al., 2021).

Special education teachers in the study site district are still unsure about the technology. According to one of the special education coordinator for the district, they want more practice with it to properly teach students with disabilities through online learning. This closely resembles Ayda et al.'s (2020) findings that special education teachers expressed a lack of experience using technology in online learning to teach students with disabilities. Teachers in special education were less optimistic about teaching diverse students with online learning (Cooper et al., 2018). Furthermore, there is a significant gap in practice regarding how elementary special education teachers use technology to meet the needs of students with disabilities through online instruction.

Purpose of the Study

The purpose of this basic qualitative study was to explore the perceptions of elementary special education teachers in a school district in the southeastern United States of their pedagogical and technology concerns regarding the shift to online learning for students with disabilities. I conducted semi structured interviews with 10 elementary special education teachers selected from the school district to collect data addressing the study problem under investigation. This study could fill a gap in practice by improving how elementary special education teachers use technology to meet the needs of students with disabilities through online instruction.

Research Questions

RQ1: What pedagogical concerns do elementary special education teachers at a school district in the southeastern United States have related to the shift to online learning for students with disabilities?

RQ2: What technological concerns do elementary special education teachers at a school district in the southeastern United States have related to the shift to online learning for students with disabilities?

RQ3: What are the problems and issues faced by the teachers when implementing online learning with students with disabilities?

Conceptual Framework

Rogers's (1995, 2003) theory of diffusion and the CBAM (Hall et al., 1973) comprised the conceptual framework for this study. The CBAM includes the concepts, strategies, and tools that enable a person to contribute to the change process and ensure success and sustainability (Al-Furaih and Al-Awidi, 2018; Hall et al., 1973). In the theory of diffusion, Rogers described how a new idea is adopted by members of a specific community. The theory promotes a better understanding of how academics use technology and the development of strategies to increase its use in the classroom (Rogers, 2003).

I employed the CBAM and Rogers's theory of diffusion in this study to examine technology adoption through the eyes of elementary special education teachers. The CBAM has been used to investigate teachers' concerns about technology and how to use it on numerous occasions (e.g., Georgiou and Ioannou, 2019; Hall and Ford, 2006). The

diffusion theory can assist elementary special education teachers better understand how to adopt and implement new ideas.

Nature of the Study

In this study, I employed a basic qualitative design. The qualitative research method was chosen as the study's approach based on the study's purpose and research questions. A qualitative approach is used to learn more about people's experiences and perspectives and how they interpret those experiences (Ravitch and Carl, 2016). The flexible basic qualitative research design lets the researcher pay more attention to the details of the individuals' experiences and perceptions, allowing for a more profound and detailed understanding of their experiences and perceptions (Patton, 2015). I conducted semi structured, in-depth interviews with elementary special education teachers in the school district (see Appendix). Participants were chosen based on whether they are currently or have previously taught online students with disabilities. The interviews were transcribed, and the audio recordings of the interviews were listened to multiple times to ensure the accuracy of the interview transcripts. Several coding iterations were used during analysis to arrive at thematic descriptions (see Patton, 2015). I coded and hand coded each interview transcript.

Definitions

Assistive technology (AT): Any mechanical, electronic, computer-based, nonelectronic, or non-computer-based instructional materials, strategies, or services that people with disabilities can use to help them learn, gain access to resources, develop

competence and success in the workplace, or improve their quality of life (Rao et al., 2021).

The Assistive Technology Act of 1988: Reauthorized in 1998, this act included an expansion of technology that goes beyond being used for functional instructional needs. The expansion ensured that students with disabilities, regardless of their educational setting, had greater access to the general curriculum (Gargiulo et al., 2018).

Center for applied special technology: Organization that promotes and supports universal design for learning (UDL) to create and expand learning opportunities for people with special needs (Center for Applied Special Technology, 2020).

CBAM: A research-based system that describes how people learn about and adopt new technologies (Hall et al., 1973).

Community of practice (CoP): A group formed for the purpose of learning together in a common area or toward a common goal (Lave and Wenger, 1991).

Diffusion: The procedure for introducing and adopting a new idea within a group over time (Rogers, 1995, 2003).

Individuals With Disabilities Education Act (IDEA): A federal law that aids state and local educational systems in meeting the needs of all disabled people and their families. IDEA (2004b) guarantees all children with disabilities the right to free and appropriate education in the least restrictive environment possible.

Innovation: Any resource, tool, idea, or practice that a person has never used before. An innovation is a resource, tool, or idea perceived as novel (Rogers, 1995, 2003).

Levels of use (LOU): Humans progress through eight levels when learning to use an innovation. There are several levels of use, ranging from no use to full use (Hall et al., 1977).

Stages of concern (SOC): The seven stages of concern that people undergo as they adopt a new technology (Hall et al., 1973).

UDL: A framework created to allow for flexible teaching methods and curriculum access for students. The focus is on advocating for (a) multiple means of representation, (b) multiple means of expression, and (c) multiple means of engagement to accommodate and provide universal access to digital content (Basham et al., 2020).

Assumptions

This study was based on two assumptions. The first assumption was that during the interview process, participants would be truthful. The second assumption was that participants would be able to respond to the research questions in a meaningful way.

Scope and Delimitations

Participants in this study included 10 elementary special education teachers who provided online learning to students with disabilities. Since the beginning of the COVID-19 pandemic, special education teachers have been providing online instruction. However, the school district study site did not provide special education teachers with any formal training or knowledge to teach students with disabilities online. Participants were chosen from 10 out of the 11 elementary schools in the district through a purposeful sampling process. I also contacted a few more participants than the required 10 participant so that I could use one of them if any of the participants first selected dropped

out from the study for some reason. Participants were selected based on whether they were currently or had previously taught online students with disabilities.

Transferability indicates the level to which the findings of this study can be applied to other districts. It is the researcher's responsibility to provide thick descriptions to help readers gain a deeper understanding of the context around the research setting and data collection (Merriam& Grenier, 2019). For this reason, I provided thick descriptions of the school district and special education settings where elementary special education teachers provided online instruction to students with disabilities. This may help my readers determine whether the findings of my study are transferable to other districts and special education settings with similar demographics. For this study, alternative conceptual frameworks such as experiential learning theory, situated learning theory, technological pedagogical content knowledge (TPACK), and constructivist learning theory were taken into consideration. None of these theories specifically address the adoption of an innovation, even though they may all be appropriate for studies looking at people's perspectives in new learning scenarios.

Limitations

A potential limitation of this study was that participants could have dropped out during the data collection process, affecting the study's results. Since I identified more than the required number of participants, this obstacle was avoided during the data collection process. The participants in this study was limited to the school district's elementary special education teachers. As a result, the findings may not apply to secondary special education teachers in the district.

I did not interview any special education teachers where I am employed to avoid bias. Semi structured interview questions (see Appendix) were used to prevent bias. The interview questions were constructed so that participants were able to freely express their opinions in response to the main and follow-up interview questions. As the interviewer, I encouraged the participants to be honest in their answers and elaborate as needed. I exercised extreme caution in allowing my personal opinions and experiences to influence the participants' perceptions and experiences. I maintained a reflective research journal that helped me to balance my thoughts and avoid any biases that could creep into my thinking.

Significance

This study is significant because it addresses a gap in practice in online learning in special education, a topic about which there is very little research (Cagiltay et al., 2019; Connell et al., 2017; Crouse et al., 2018; Long et al., 2021; Rice, 2017; Steed & Leech, 2021; Supratiwi et al., 2021; Tindle et al., 2017; Trust & Whalen, 2021). Consequently, the importance of this study relies on the potential to impact decisions and policies related to online learning for students with disabilities at elementary schools in the local district. By identifying the resources and training needs of the elementary special education teachers, school and district leaders may be better positioned to support these teachers. Given that students with disabilities are typically at a disadvantage, implementing initiatives to support elementary special education teachers may lead to improved online learning, allowing students to experience the same learning as they would in face-to-face learning. This study's findings could impact policymakers

considering educational platforms and programs for elementary special education teachers to conduct online learning for students with disabilities successfully. If educational platforms and programs are tailored to students with disabilities online, these potential pedagogical and policy changes could eventually result in an improved online environment for students with disabilities. Students with disabilities may have a better chance of succeeding online and improving their self-regulation skills. It may result in more elementary special education teachers becoming more comfortable with conducting online learning for students with disabilities as they see the potential benefits of having platforms and programs tailored to their students' needs. Furthermore, these decisions and policies could be extended to other school districts in order to address similar issues associated with the shift to online learning for students with disabilities.

Summary

In this chapter, I have shown that the educational implications of this growing online learning phenomenon for students with disabilities have not been fully explored. Elementary special education teachers began using technology for online instruction at the beginning of the COVID-19 pandemic without being adequately trained. In this chapter, I have summarized the purpose of the study, which was to explore the perceptions of elementary special education teachers in a school district in the southeastern United States of their pedagogical and technology concerns regarding the shift to online learning for students with disabilities. Additionally, the RQs were aligned to Roger's (2003) theory of diffusion and the CBAM (Hall et al., 1973). Finally, I concluded the chapter with the study's assumptions, scope, and limitations. In Chapter 2,

I will further develop the conceptual framework comprised of Rogers's (2003) theory of diffusion and the concerns-based adoption model (Hall et al., 1973). Then I will provide an overview of recent research relevant to the current study and further define the gap in practice that justified the study.

Chapter 2: Literature Review

The problem addressed through this study is that elementary special education teachers are required to provide online learning instruction to students with disabilities as schools are navigating through the COVID -19 pandemic with a lack of information as to how to do so successfully. Therefore, it was essential to understand elementary special education teachers' perceptions about their pedagogical and technological concerns to understand the areas they need more training in. The purpose of this qualitative study was to explore the perceptions of elementary special education teachers in a school district in the southeastern United States of their pedagogical and technological concerns regarding the shift to online learning for students with disabilities.

There is little information on online learning in special education (Cagiltay et al., 2019; Connell et al., 2017; Crouse et al., 2018; Long et al., 2021; Rice, 2017; Steed & Leech, 2021; Supratiwi et al., 2021; Tindle et al., 2017; Trust & Whalen, 2021). Much of the extant literature on the topic concentrates on online learning in middle school, high school, and higher education rather than elementary school. Some of the literature contains information about preservice and current teachers' perceptions of and experiences with technology adoption related to online learning for students with disabilities (Akbayrak et al., 2021; Cooper et al., 2018; Kamau et al., 2018).

The literature review strategy and the conceptual framework of Rogers's theory of diffusion and the CBAM are covered in Chapter 2. I examine the topic of online learning for students with disabilities in this literature review, including the concepts of self-regulation, a lack of online access and resources, collaboration, accommodations and

modifications, universal design for learning, guidance, teacher preparation, family collaboration, and professional development.

Literature Search Strategy

I found the extant literature on online learning in special education using the Walden University Library and Google Scholar. The primary databases accessed were ERIC, EBSCOhost, Taylor and Francis, and Sage Publications. To locate the literature, I used the following search terms: *special education teachers, special needs teachers, technology adoption, pedagogically, technologically, students with disabilities, children with disabilities, special needs, learning disabilities, online learning, virtual learning, distance learning, hybrid learning, online special education, COVID-19 and pandemic, concerns-based adoption model,* and *theory of diffusion.*

There has been a lack of current research on online learning in special education published in the last 5 years. The articles that were available were limited due to the fact they were published older than 5 years ago. I used the reference lists of articles reviewed for inclusion in this literature review to locate additional peer-reviewed articles and journals relevant to this research topic. This helped find more relevant, scholarly articles on online learning in special education.

Conceptual Framework

The conceptual framework for this study was based by Rogers's (1995, 2003) theory of diffusion and the CBAM. The theory of diffusion is defined as the process by which an innovation is adopted by members of a specific community (Rogers, 1995, 2003). The theory promotes an understanding of how academics use technology and the

development of strategies to increase its use in the academic environment (Rogers, 2003). The concerns-based adoption model contains a definition of the concepts, strategies, and tools that enable individuals to contribute to the change process (Al-Furaih & Al-Awidi, 2018; Hall et al., 1973).

Rogers's Theory of Diffusion

Rogers (1995, 2003) created the theory of diffusion in 1962. Rogers's (2003) defined technology adoption as how an innovation is communicated to members of a social system over time via specific channels (Goh & Sigala, 2020). Roger (1995, 2003) classified innovators according to their innovativeness, which is the degree to which an individual adopts a novel idea (Kamau et al., 2018). The following categories of adopters are identified and defined in the theory:

- Innovators: Seen as risk-takers who are uneasy with uncertainty and are willing to accept any setback associated with the failure of an innovation.
- Early adopters: Their peers hold them in high regard and frequently seek their advice and information on new technology and innovation. They are viewed as opinion leaders who, by adopting the innovation, certify it for the masses.
- Early majority: May deliberate for some time before fully embracing an idea.
- Late majority: They have limited resources, and their concerns about novel ideas must be addressed before adopting the novel idea. Peer pressure is a powerful motivator for adopting innovations.
- Laggards: Natural tendency to be skeptical of novel ideas and resist change. The time required to adopt a new idea or technology is considerable because

their resources are limited. They want to be sure that the innovation will make a difference before committing resources (Rogers, 1995, 2003).

These adoption categories are represented graphically by a bell curve (Kamau et al., 2018). This is also referred to as the adoption s-curve (Rogers, 2003). Within the bell curve, innovators (2.5% of the adopting population) are at the low end, early adopters (13.5%), early majority (34%), late majority (34%), and laggards (16%) are at the high end (Kamau et al., 2018). The point of sharp increase is critical because it indicates that sufficient individuals in a system have adopted the innovation for the adoption rate to become self-sustaining (Goh and Sigala, 2020; Rogers, 2003). Innovation and change are stifled when this critical mass is not reached (Goh and Sigala, 2020; Rogers, 2003).

In the theory of diffusion, Rogers (2003) also stated that the adoption rate of an innovation is determined by the adopter's perception of five major attributes: relative advantage, compatibility, complexity, trialability, and observability (Benbaba and Lindner, 2021; Chizwina and Mhakure, 2018; Goh and Sigala, 2020). . The five attributes are defined in detail below:

- Compatibility: The degree to which an innovation is perceived to be consistent with the existing values and prior experiences, of potential adopters.
- Complexity: Innovation is viewed as being difficult to comprehend and apply. People tend to avoid adopting technologies perceived to be challenging to use or understand. Rogers (2003) postulated that this is a frequent cause of limited diffusion.

- Trialability: This can be used experimentally on a limited basis. Rogers contended that there was a direct correlation between the adoption rate of an innovation and the positive perceptions of individuals trying the innovation for a limited time.
- Observability: The extent to which an innovation's results are visible to others. Apart from relative advantage and compatibility, this characteristic is positively associated with the rate of innovation adoption.
- Relative advantage: the degree to which a new innovation is regarded as superior to the concept, method, or item it replaces

Kamau et al. (2018) incorporated the theory of diffusion in a study of technology adoption by secondary mathematics teachers in Kenya. Six teachers were chosen to participate in their study that examined two of the five categories of technology adopters in schools: early adopters and late adopters. This study classified three teachers as early adopters, while three were late adopters.

According to the findings, the presence of both early and late adopters suggested that classrooms should be equipped with technology infrastructure to embrace technology fully. Early adopters incorporated technology into their classroom instruction because they believed it would benefit them and their students (Kamau et al., 2018). This finding aligns with Rogers's (2003) concept of the perceived attributes of technology; early adopters recognized that technology offered relative benefits and was compatible with their classroom needs. Rogers argued that the greater an innovation was perceived as relatively advantageous, the faster it will be adopted, and that relative advantage is

positively related to the adoption rate. This also includes the calculability of innovation in terms of adoption rate. Early adopters recognize that technology meets their instructional needs and is compatible with their pedagogical philosophy regarding student learning and previous experiences. Kamau et al (2018) found that late adopters did not see technology as having any relative advantage over their pedagogy and believed it was incompatible. Late adopters believed that technology did not adequately prepare students for exams or add value to learning.

Early and late adopters both perceived technology to be complex for instructional purposes despite being available due to a lack of adequate training (Kamau et al., 2018). Rogers (2003) asserted that the complexity of an innovation has a detrimental effect on its adoption rate. Kamau et al. (2018) also discovered that teachers who found technology challenging to use did not use it due to a lack of adequate training and that a school's lack of technology infrastructure hampered technology adoption. Teachers did not have unrestricted access to technological resources (Kamau et al., 2018). For instance, a school had two smart boards, one unused in the library. To use the smartboard, a teacher had to reserve the library and relocate classrooms, which resulted in some teachers not using technology. Regarding Rogers's tribal attributes (i.e., experiment and observability), the teachers lacked opportunities to experiment with technology or observe their colleagues. Overall, the findings of Kamau et al.'s study can be used to assist school leaders in adequately training teachers to adopt technology and expand classroom technology resources.

Another study that incorporated diffusion theory was Goh and Sigala's (2020) examination of the barriers that prevent teachers from adopting new information and communication technologies in their instruction and the strategies for overcoming these barriers. The researchers aimed to identify and discuss the obstacles to integration in classroom instruction while also challenging their current pedagogy. The theory of diffusion was used to develop a practical and systematic approach for guiding and supporting instructors in adopting technology in the classroom.

Goh and Sigala (2020) identified four steps school leaders should take to increase student technology adoption. The first step is for leaders to recognize and understand that there are five distinct types of adopters and that they cannot expect all instructors to embrace an innovation concurrently. The leaders should solicit support from early adopters and hold training workshops during the early stages of implementation. The trialability of innovations is a critical characteristic that contributes to their increased adoption rate (Rogers, 2003). The second step is for school leaders to employ strategies to maintain positive attitudes toward the innovation once all instructors know it. The innovation should be perceived as simple to use and operate. The third step is that once an instructor decides to adopt the innovation, the school must provide adequate support to resolve any issues before the instructor's confidence in the innovation is lost. The researchers suggested that leaders recognize those who embraced the innovation to advocate for its benefits to colleagues in the classroom. The final step is to establish the critical mass proposed by Rogers (2003) to ensure that the early and late majority embrace the innovation because they comprise 68% of the faculty. Goh and Sigala

suggested that school leaders target younger staff members or staff members with fewer years to encourage them to adopt an innovation because they are more likely to do so than veteran staff members. Overall, this study's findings can be used to assist school leaders in promoting innovation within the school.

Chizwina and Mhakure's (2018) study on the use of technology in teaching mathematics in higher education was another study that incorporated the theory of diffusion. The purpose of this study was to ascertain whether five mathematics professors use technology in their classroom instruction. The five characteristics of diffusion theory were used in this study to explain why mathematics teachers in higher education who took a bridging course adopted the technology. The researchers asked participants questions about each of the five attributes of the diffusion theory. The findings indicated that adoption decisions were primarily influenced by relative advantage and compatibility. Concerning compatibility, the primary concerns were the teachers' attitudes and beliefs. Complexity is critical for compatibility. If a teacher cannot quickly write an equation using a technology tool, they will revert to the paper and pencil method. Due to a lack of support, the researchers determined that observability did not play a significant role. The diffusion theory revealed an inconsistency between technology adoption beliefs and practices. While some teachers believed that technology was critical, they also believed that the bridging course was too basic to justify its use.

I used Rogers's diffusion theory to examine technology adoption through the eyes of elementary special education teachers in this study. The theory of diffusion can used to help elementary special education teachers better understand adopting and implementing

an innovation. The five attributes of diffusion theory guided the development of the interview questions (see Appendix) in this study. The five characteristics aided me in determining how elementary special education teachers perceive online learning as they transition to online learning.

CBAM

The CBAM was used in conjunction with Rogers's theory of diffusion to form the conceptual framework. The CBAM was appropriate to use with Rogers's theory to describe elementary special education teachers' perceptions of technology adoption as they transition to online learning. Although Rogers's diffusion theory provides another method for determining where individuals fall in the adoption process, it lacks the depth of resources and tools required to pinpoint and address teacher attitudes and needs. When combined with the CBAM's stages of concern and levels of use, Rogers's theory can add perspective to an individual's attitudes toward adopting and implementing an innovation. In the CBAM, change is described from the perspective of individuals rather than those at the system level (Al-Furaih & Al-Awidi, 2018). The CBAM has been used numerous times to investigate teachers' concerns about technology and how to use it (e.g., Georgiou & Ioannou, 2019; Hall & Ford, 2006). Use of the CBAM and Rogers's (2003) theory support that learning is transferred to practice over time and among people (Hall and Hord, 2006).

The CBAM was first used at the University of Texas in 1973 (Hall et al., 1973). The CBAM contains explanations of the concepts, strategies, and tools that allow someone to participate in the change process (Al-Furaih & Al-Awidi, 2018; Hall et al.,

1973). SOC, LOU, and innovation configuration are the three concepts that make up CBAM. These ideas serve as a foundation for analyzing technology implementation and have been used in previous studies (Al-Furaih & Al-Awidi, 2018). As a result, individuals who are going through a change can get the help they need.

I used the CBAM concepts of LOU and SOC in this study. The LOU is an interview format that seeks to identify individual behaviors and courses of action as the innovation phases are implemented (Hall et al., 1977; Olson et al., 2020). The interview format for LOU follows a scripted guide that focuses on identifying individual behaviors related to the nonuse and use of an innovation that is being implemented. The LOU is divided into three categories: nonuse (Levels 0–2), user focused (Levels 3–5), and client focused (Levels 6-7). Hall and Ford (2006) identified and defined the eight levels of use and behaviors as follows:

0. Nonuse: Individuals are unaware of the innovation and are unmotivated to use it.
1. Orientation: Individuals are interested in learning more about the upcoming innovation.
2. Preparation: Individuals have devised a strategy to begin implementing the innovation.
3. Mechanical: Individuals are willing to use innovation to change the organization.
4. Routine: Individuals have developed a pattern in their use of a innovation.
5. Refinement: Individuals continue to innovate to benefit their students.

6. Integration: Individuals start collaborating with others on the innovation.
7. Renewal: Individuals are still looking for more information about alternatives to the innovation.

The Stages of Concern Questionnaire (SOCQ) is a questionnaire that focuses on individuals in the change process by obtaining their perception of the change that is taking place (Al-Furaih and Al-Awidi, 2018; Hall et al., 1973). The SOCQ is a 35-item questionnaire that uses seven stages to assess individuals' concerns about adopting an innovation. The seven stages of concern were identified and defined by Hall et al. (1973) as follows:

0. Unconcerned: Individuals are unconcerned about the change that is occurring.
1. Informational: Individuals are aware of the change but are unaware of it and seek information.
2. Personal: Individuals are aware of the change taking place but are unsure of where they will be in the process.
3. Management: Individuals collaborate with the resources involved to implement the innovation and determine the best way to use the resources.
4. Consequences: Individuals begin to learn about the innovation and wonder what impact it will have on their students.
5. Collaboration: Individuals are curious about how their colleagues utilize innovation and reach out to them to collaborate.
6. Refocusing: Individuals are beginning to recognize the benefits of innovation and make changes to meet their needs.

These stages can assist in determining the various types of concerns that an individual has about an innovation. Individuals in stages 1 through 3 are considered to have low-level concerns. Individuals in stages4 through 6, on the other hand, are classified as having a high level of concern (Georgiou and Ioannou, 2019; Hall et al., 1977). According to de Vocth et al. (2017), low-level concerns are not practical for innovation, and high-level concerns can occur after low-level concerns within the SOC are addressed. This means that high-level concerns are critical for change and sustaining the use of the innovation after it has been implemented.

One of the studies incorporating CBAM is Al-Furaih and Al-Awidi's (2018) study on smartphone adoption in Kuwait secondary schools. In this study, 610 secondary school teachers from 10th through 12th grade participated. The study used SOCQ to determine these teachers' readiness and technological competency when incorporating smartphones into their classrooms as an innovation. Although smartphones have been available for more than a decade, teachers do not use them in their classrooms (Al-Furaih and Al-Awidi, 2018).

The survey results revealed that teachers were most concerned about informational, personal, consequences, collaboration, and refocusing issues. According to the survey, teachers had the lowest level of concern for unconcerned and management (Al-Furaih and Al-Awidi, 2018). These findings indicate that teachers were aware of smartphones and how they could affect their students' learning. According to Al-Furaih and Al-Awidi (2018), the results support the CBAM's belief that individuals go through

SOC regularly when implementing an innovation. Overall, the findings of this study can be used to develop programs that support teachers' use of smartphones in the classroom.

Another study incorporating the CBAM was Georgiou and Ioannou's (2019) study on teachers' concerns about adopting technology-enhanced embodied learning apps through professional development. This study solicited 31 primary education teachers' concerns about adopting technology-enhanced learning. The goal of the professional development was to equip teachers with the knowledge and confidence to use technology to improve embodied learning and meet the needs of all students in an inclusive setting (Georgiou and Ioannou, 2019). The SOC was used to investigate teachers' concerns about implementing the innovation in this study. An open-ended question was used in addition to the questionnaire to confirm the teacher's concerns, as in previous studies using the SOCQ (Georgiou and Ioannou, 2019).

According to the findings of this study, collaboration and informational concerns were the highest in the SOC. While personal, management, and consequences were unconcerned (Georgiou and Ioannou, 2019). According to these findings, the teachers approach the co-operator profile with only one contradiction. There is usually severe concern in the consequence stage; however, this stage was low for the teachers in this study (Georgiou and Ioannou, 2019). According to Georgiou and Ioannou (2019), having many co-operators at the beginning of the adoption stage of innovation is beneficial because these people are eager to learn about the innovation and collaborate to understand it.

According to the responses to the open-ended questions, the teachers went through all six SOC while participating in the professional development. Although professional development significantly impacted teachers in the low concern stage, professional development did not address high-level concerns. Georgiou and Ioannou (2019) Teachers in the refocusing stage require additional professional development to support technology-enhanced embodied learning apps. This is because most technology-enhanced embodied learning is designed for research, is expensive, requires much attention, and does not correlate with the curriculum (Georgiou & Ioannou, 2019; Ioannou et al., 2019; Karakostas et al., 2017). Overall, the CBAM is an effective method for identifying teachers' concerns about implementing an innovation.

The CBAM model will be used in this study to understand technology adoption from the perspectives of elementary special education teachers. The LOU and SOC will assist in further identifying elementary special education teachers' perceptions, concerns, and level of use of technology in the shift to online learning. The LOU will guide this study's interview questions (see Appendix). The LOU interview and SOCQ will aid in determining the perceptions of elementary special education teachers as they transition to online learning. The findings of this study will be used to assist school administrators in developing appropriate training for elementary special education teachers.

The diffusion theory and CBAM model will aid this study's research. As they process technology adoption with the shift to online learning, the LOU and SOC will determine the level of concern and use that elementary special education teachers have. This study may add to the literature because the diffusion theory, LOU, and SOCQ, have

never been used to investigate the technology adoption of elementary special education teachers in the shift to online learning. Because current literature does not correlate elementary special education teachers, technology adoption, or online learning, the findings of this study may help fill in a gap in practice.

Literature Review Related to Key Concepts and Variable

Self-Regulation

This section contains information about self-regulation for students within online learning. The literature focuses on parents' and teachers' support for self-regulation. The following two sections provide research-based information on how parents and teachers can help students with disabilities self-regulate in online learning (Bornert - Ringleb et al., 2021; Kim and Fienup, 2021; Sulaimani, 2017).

Teachers Support Self-Regulation

Students with disabilities frequently lack self-regulation when participating in online learning. Although students with disabilities were participating in online learning, their engagement was low (Bornert -Ringleb et al., 2021; Kim & Fienup, 2021; Sulaimani, 2017; Yazcayir and Gurgur, 2021). Only half of the school districts in the country track student engagement in learning through attendance or one-on-one check-ins when schools first closed due to COVID -19 (Gross and Opalka, 2020). In one study, Gross and Opalka (2020) discovered that students who had the resources to participate in online learning did not do so for various reasons. Some of the reasons are parents working, a lack of self-regulation for online learning, a lack of technology skills to use resources appropriately to engage with remote learning, or a lack of specific expectations

for online learning. This is consistent with previous research on the role of self-regulation in digital learning, which has shown that higher self-regulation leads to better learning outcomes (Bergamin and Hirt, 2018; Hromalik and Koszalka, 2018).

According to four studies, students with disabilities frequently struggled with assignment completion, could not follow along, had behavioral issues, and did not attend online sessions (Bornert - Ringleb et al., 2021; Kim & Fienup, 2021; Sulaimani, 2017; Yazcayir and Gurgur, 2021). In one study, Kim and Fienup (2021) described a situation in which a teacher implemented a system that listed five assignments for students who struggled in the online environment to complete. The teacher would reward the students if they completed all five assignments. This intervention was effective for students with disabilities because their engagement increased, their work completion increased, and the teacher experienced fewer behavioral issues in the online environment. According to Hughes et al. (2017), task analysis promotes successful learning by establishing clear expectations and consequences as explicit instruction. Interventions like this are critical for increasing students with disabilities' engagement in online learning. This information is essential to my study as it provides knowledge about the likely obstacles students with disabilities face in the online environment.

Parental Support With Self-Regulation

Parental support is critical in assisting students with disabilities to self-regulate and succeed in online learning. Bornert-Ringleb et al. (2021) and Lambert and Shuck (2020) discovered a disparity in-home support for students with disabilities when compared with their regular education peers. When the demand for digital learning

becomes too great, parents can serve as an external regulators for their children. They can offer assistance by monitoring or reminding their child of the task (Bornert-Ringleb et al., 2021). Lambert and Shuck studied three elementary teachers who used a digital learning system for communication and academics. Many families were using the learning system. The learning system's goal was to develop new routines at home to support learning and make families comfortable transitioning to online learning.

Students with disabilities were reported to have some help at home, but it was not always consistent. Students with disabilities struggle with online learning without consistent support (Lambert and Shuck, 2020). In one study of 722 special education teachers, Bornert-Ringleb et al. (2021) discovered that parental support is an obstacle to online learning and makes it challenging to implement. Another study by Lambert and Shuck found that one teacher created an online learning video for students with significant needs who lacked adequate support at home. According to Lambert and Shuck, the videos were made because the students had the opportunity to interact but lacked the skills to do so; they needed to interact independently to watch. Support from parents at home is essential for students with disabilities to succeed in online learning. As a result, teachers should provide parents with support and resources to aid in their child's self-regulation.

Although teachers of students with disabilities offered support to parents on how to work on their child's skills, monitor learning, and get things in place in the online setting, there were still challenges even when parents tried (Bornert-Ringleb et al., 2021; Lambert and Shuck, 2020). For example, Lambert and Shuck reported that the three

elementary teachers offered to meet with parents one-on-one to provide support if they needed it in managing challenging behaviors online. With the offered help, sessions did not always go as planned because parents did not consistently assist their children in the online environment (Bornert-Ringleb et al., 2021; Lambert & Shuck, 2020). Therefore, it is evident that collaboration between parents and teachers is essential for increasing the self-regulation of students with disabilities in online learning. This is an important aspect that is relevant to my study.

Lack of Online Access and Resources

This section provides information about the lack of online access and resources. The COVID-19 pandemic further exposed the digital divide that is associated with online learning. The following two sections provide research-based information on the lack of online access and resources from the perspective of teachers and students with disabilities (Catalano et al., 2021; Khasawneh, 2021; Trust & Whalen, 2021).

Student Online Access

Some students with disabilities lack internet access or mobile device to participate in online learning. Students with disabilities tend to have less access to the internet or a mobile device than their general education peers (Catalano et al., 2021; Trust & Whalen, 2021; Yazcayir & Gurgur, 2021). The educational problems associated with the pandemic exposed the digital divide between students with access at home to technology and students with limited or nonexistent home access (Catalano et al., 2021). According to Auxier and Anderson (2020), research indicated how clear the digital divide is, with higher-income families typically having an abundance of technology while lower-income

families simply do not. It was also noted that a single computer might be shared among children and adults in lower-income families. Even though a computer may be in the home, it is not always available.

In one study, Yazcayir and Gurgur (2021) did a study with 15 parents of students with disabilities. It was found that although there was often a mobile device in the home, the parent would need it when they had to go out, which indicated that even though the students might have had access to a mobile device for online learning, the device was often shared. Students having access to a mobile device is critical for online learning access. In a study by Trust and Whalen (2021), it was reported that most of the population that receives free/reduced lunch do not have access to devices or the internet. While there was a plan for providing devices, if the student cannot access the internet, the device does no good for the student (Trust & Whalen, 2021).

Internet access is a barrier for many students with disabilities. Catalano et al. (2021) and Trust and Whalen (2021) found that some students with disabilities would have to share their mobile devices with other people in the household. In a study with 300 K-12 teachers in New York (Catalano et al., 2021), the teachers saw a lack of internet access or mobile device as a barrier to online learning for students with disabilities. In another study with 334 K-12 teachers, Trust and Whalen found that the teachers saw technology as a challenge because some students did not have internet or share a device. Several teachers struggled to figure out how to ensure learning for students in online learning when students' access to technology depended on the device they had, if, or when they accessed the device and internet connection.

Teacher Online Access

Teachers lack resources to conduct online learning with students with disabilities. Although teachers were conducting online learning, they still lacked the infrastructure and resources to conduct it (Cagiltay et al., 2019; Khasawneh, 2021; Trust & Whalen, 2021). In one study with 22 special education teachers in Jordan, Cagiltay et al. (2019) found a lack of educational material developed for the audience of special education. The study revealed that the participant found materials meant for general education students and was not well aligned with special education. In another study, Khasawneh (2021) reported that a lack of equipment development limited the use of online learning. There are material obstacles such as providing and updating computers and the internet, and human barriers such as not changing pedagogy related to the lack of teachers in the technological and technical skills needed for online learning.

Limited classroom equipment, knowledge of the equipment, and financial restraints make it hard to obtain and maintain the technology needed (Bicen et al., 2018; Cagiltay et al., 2019; Khasawneh, 2017). In one study with 80 special education teachers, Bicen et al. (2018) found that these teachers had a low level of use of technology. The teachers typically use Microsoft office programs to prepare presentations. Although they could record or share videos with various tools, unfortunately, they were insufficient in using the smartboard, creating e-books, and virtual animation videos with the technology. In another study, Khasawneh (2017) reported that other obstacles teachers face with technology includes a lack of specialist to design educational materials, the use of multimedia, and the high cost of obtaining and keeping software for online learning.

Collaboration

Collaboration is critical to increasing teachers' technological knowledge while teaching students with disabilities online. Teachers require support and guidance from colleagues and school leadership to address their concerns about technology (Al-Furaih & Al-Awidi, 2018; Anderson & Putman, 2020; Ciampa, 2017; Pearson et al., 2019). In one study with three special education teachers, Ciampa (2017) investigated whether professional development increases these teachers' confidence and competence in using technology. It was found that these teachers expressed satisfaction with the professional development because of the opportunities for hands-on, collaborative learning by exploring and evaluating websites that support their student's learning. This goes along with Vygotsky's (1978) social constructivist theory that learning is a mediated and collaborative process that occurs through interactions and sharing (see Ciampa, 2017; Vygotsky, 1978).

The Zone of Proximal Development emphasizes the guidance of mentors and experts as they enable the novice learner to achieve success, more complex skills, understanding, and ultimately independence (see Ciampa, 2017; Vygotsky, 1978). Ciampa (2017) suggested that a mentor who has technological knowledge expertise work with special education teachers to examine the factors that lead to the use of technology. It was also recommended that communities of practices rather than professional learning because it is seen as realistic to mentoring that can improve teachers' use of technology in instruction (Ciampa, 2017). When implementing a community of practice, teachers may consider having a technology expert manage the technology to keep it running correctly.

However, the necessity of mentorship might depend on individual teachers' comfort with technology. Research with general education teachers indicated that teachers' use of technology in the classroom included their technical knowledge and confidence with using technology, teaching experience, beliefs about pedagogy and technology, and their perception about using it (Cheng & Xie, 2018). It can also be noted that research on these constructs with special education teachers is limited (Anderson & Putman, 2020). Anderson and Putman (2020) found that special education teachers with high technological knowledge independently found ways to increase their technological knowledge. However, special education teachers that were less confident in their knowledge needed more time, practice, and support from their colleagues (Anderson and Putman, 2020). This information is critical to my study as it provides knowledge about teachers' likely obstacles when using technology.

Accommodations and Modifications

This section provides information about accommodation and modifications in the online environment for students with disabilities. The following areas offer research-based information about special education law regarding accommodation and modification regardless of the educational setting and accommodation and modifications in online learning and online resources for students with disabilities (Akbayrak et al., 2021; Atanga et al., 2020; Moreno, 2020 Rice, 2017; Rice & Dykman, 2018).

Laws to Accommodation and Modifications

Students with disabilities require the modifications and accommodations outlined in their Individual Education Plan (IEP). Accommodations and modifications in students'

IEPs are frequently misinterpreted by general education teachers, special education teachers, service providers, and administrators (Rice, 2017; Rice & Dykman, 2018). According to Rice and Dykman (2018), limited research is available on students with disabilities receiving accommodation and modification in the online environment as intended. It was stressed that while course designers are not directly responsible for working with students with disabilities, they have a say in the accessible features that may be critical to their success (Rice, 2017; Rice & Dykman, 2018).

Teachers and administrators had few opportunities to improve their knowledge of online accommodations and modifications for students with disabilities, according to Rice's (2017) findings. There was a lack of emphasis on technological learning, it was noted. Teachers and administrators agreed that too much technology was in the classroom; some claimed to learn technology independently or through informal consultation (Rice, 2017). It was suggested that rather than waiting for state and federal guidance, educators should use policy guidance and research to the best of their abilities to secure students' rights to Free Appropriate Public Education (Rice, 2017; Rice & Dykman, 2018).

Use of Accommodation and Modification

Accommodations and modifications are beneficial for students with disabilities in online learning, just as they are in traditional classrooms, to meet their unique learning needs (Akbayrak et al., 2021; Sulaimani, 2017). Akbayrak et al. (2021) found that students with visual and hearing impairments have difficulty developing communication in a study with 15 special education teachers in Turkey. With students with these

disabilities, it was discovered that one-on-one interaction works best. This example of a modification is just one of many those students with disabilities may require, as these students have varying support needs, and online learning should reflect these differences. Sulaimani (2017) discovered that using appropriate accommodations and modifications in technology to meet students' support needs gave students with disabilities new ways to express themselves, such as using pictures, clicking, and pointing to the answer, in a study with seven elementary teachers. In special education, the term "technology" means devices that help students with disabilities increase, maintain, or improve their functional abilities (Friend, 2018; Ok, 2018). This is most common for students with special needs who use a picture exchange system to communicate in their classroom (Friend, 2018; Ok, 2018). Students can complete tasks in a variety of ways, thanks to technology. For instance, instead of using traditional paper and pencil, teachers could have students use the smartboard to complete a task (Sulaimani, 2017).

In the online environment, assistive technology (AT) improves the accessibility of instruction for students with disabilities. Assistive technology is a tool that helps students with disabilities meet their unique needs (Rao et al., 2021). The Individuals with Disabilities Education Act (IDEA) mandates that technology be accessible to students with disabilities and that assistive technology be used with students with disabilities (IDEA, 2004). However, teachers must have a high level of knowledge to use assistive technology effectively. Atanga et al. (2020) found that teachers had limited knowledge of using assistive technology in one study. Obtaining assistive technology was identified as

the most significant barrier to implementation, resulting in teachers' limited knowledge (Atanga et al., 2020; Moreno, 2020).

According to Atanga et al. and Moreno, assistive technology in the online environment can bridge the gap between students with disabilities and their regular education peers. The Assistive Technology Act of 1988 was reauthorized in 1998, and it included an expansion of technology that goes beyond being used for functional instructional needs. The expansion ensured that students with disabilities, regardless of their educational setting, had greater access to the general curriculum (Gargiulo et al., 2018). The expansion divided assistive technology into two categories: low-tech (like reading timers) and high-tech (like mobile devices) (Moreno, 2020).

Online Resources

In the online environment, online resources and materials should accommodate and modify the needs of students with disabilities. There is a scarcity of materials designed for students with disabilities in the online environment (Cagiltay et al., 2019; Trust and Whalen, 2021). According to the two studies, regular education and special education teachers are concerned about learning students with disabilities in online learning. Concerns are raised about the accessibility and equity accommodations and modifications required to maximize student learning (Cagiltay et al., 2019; Trust &Whalen, 2021). According to Cagiltay et al. online resources are available for teachers to use. Teachers must make certain modifications or limit parts of the material to be compatible with the needs of students with disabilities,

UDL

The Universal Design for Learning (UDL) can help students with disabilities overcome obstacles in the online world. Teachers can use UDL for Learning to meet the unique needs of students with disabilities online in a variety of ways (Basham et al., 2020; Rao et al., 2021; Scott & Temple, 2017; Smith, 2020). According to a state scan, education systems that put student-centered learning at the center of their learning process, such as adopting UDL , had a more holistic and quick response to COVID-19 (Casi,2020). For example, in the United States, UDL was identified as a critical framework in 12 states' pandemic response plans (Cast, 2020). Smith (2020) reported that the UDL helps with the challenges of providing online services for students with disabilities in a study with 35 participants.

Basham et al. (2020) discovered that UDL ensures that learners can access academic content, be more accessible, and comprehend knowledge and skills in another study. Evidence-based practices, specific assessment, data-driven policymaking, and a focus on continuous improvement across the learning environment are all part of the Universal Design for Learning (Basham and Blackorby, 2020; Basham et al., 2020). Evmenova (2018) reported that the participants in a study with 70 general and special education teachers recognized the importance of the Universal Design for Learning in supporting the learning of diverse learners. The participants also saw how UDL strategies benefit the learning environment by capitalizing on student strengths while supporting their learning weaknesses (Evmenova, 2018).

The UDL principles is critical for breaking down barriers in the online environment. Through the principles of multiple means of representation, action, expression, and engagement, the UDL provides a framework to remove barriers from instruction rather than providing accommodations (Schreffler et al., 2019). The engagement principle encourages student choice by allowing them to participate in their learning in various ways, such as through text and images (Basham et al., 2020; Kennedy and Boyle, 2021; Rao et al., 2021; Smith, 2020). The representation principle emphasizes providing instruction via online activities that make the content as accessible as possible to a wide range of learners (Basham et al., 2020; Kennedy and Boyle, 2021; Rao et al., 2021; Smith, 2020). The action and expression principle focus on ways for students with disabilities to demonstrate their learning and provide flexibility in work completion (Basham et al., 2020; Kennedy and Boyle, 2021; Rao et al., 2021; Smith, 2020). According to Kennedy and Boyle (2021), the principles could aid online instructional design and delivery.

Rao et al. (2021) reported how educators could use UDL principles to support their diverse learners in the online environment. It is critical in the online environment to ensure that students access tools to help them with reading skills like decoding and comprehension. Students are frequently expected to do things independently in the online environment, and text-to-speech tools on the device can assist them (Rao et al., 2021). Students with disabilities may struggle to demonstrate what they have learned, such as through a writing task, when it comes to supporting action and expression. Students can chunk information in a multimedia format using digital tools, which provide various

opportunities to support these skills (Rao et al., 2021). Finally, supporting student engagement can be difficult in an online setting. Students are frequently expected to complete learning tasks on their own. Teachers can form small groups that foster interaction and encourage students to keep track of their tasks on a checklist (Rao et al., 2021). This information could be considered to ascertain whether these strategies could be adopted in my study.

Guidance

Online learning guidance is scarce. The state and local governments are constantly changing their policies on online learning, and everyone has different answers (Crouse et al., 2018; Long et al., 2021; Supratiwi et al., 2021). Several schools assist their students; however, a significant number of schools do not (Supratiwi et al., 2021). Crouse et al. (2018) discovered that teachers went to each other for help in developing a sense of how to master teaching students online with disabilities in a study with six fully online teachers. One participant said the teachers had no direct preparation for the online environment and described it as "trial by fire." The teachers had used technology before but had never taught online. Rice (2017) reported that teachers formed communities of practice (Lave and Wenger, 1991) to teach students with disabilities online in another study with 32 participants, so they would not have to reinvent the wheel to teach students with disabilities online. Teachers believe that better guidelines and resources for teaching students with disabilities should be in place, according to Long et al. (2021).

It is unclear how online learning for students with disabilities should be done. When it comes to special education, there is no clear answer, support, confusion, or

consistent support from the state and local levels (Steed & Leech, 2021; Tindle et al., 2017). Even though some laws and policies establish mandates and provide guidance for special education technology for students with disabilities, some obstacles make implementation difficult (Thomas et al., 2019). There are some guidance policies for special education teachers in 22 states, but no evidence of policies for IEPs in the online setting in 28 states (Tindle et al., 2017). In the United States, 84 % of states have no clear policy on IEPs in online learning, and 87% of states have no clear policy on IEP review before student transitions to online learning (Tindle et al., 2017). In one study, Connell et al. (2017) reported that support is needed to ensure that online learning for students with disabilities is taken seriously. Steed and Leech (2021) reported in another study with 1,107 participants that general education and special education teachers were not told how to carry out students' IEPs, that there were no direct guidelines, and that they were drowning in expectations. Guidance is essential for ensuring that students with disabilities consistently receive their services.

Teacher Preparation Programs

Teacher preparation programs are critical for special education teachers to work with students with disabilities online. Teacher preparation programs are critical because they demonstrate how to work with students with disabilities, as well as how to work with students who are socioemotionally disturbed, how to avoid feeling overwhelmed, and how to teach from a distance (Cooper et al., 2018; Hager & Fiechtl, 2019; Sayman & Cornell, 2021; Van Garderen et al., 2020). Cooper et al. (2018) conducted a study with 33 pre-service teachers to practice teaching on an online teaching model for specific content.

The teachers were more comfortable teaching online than previously, but they were less optimistic about teaching diverse learners and aspects online. In another study, Dinçer (2018) discovered that many graduate students in teacher education programs do not feel adequately prepared to integrate technology to support the needs of students with disabilities. In another study, Brewer and Movahedazarhouligh (2019) found that special education teachers need more resources to help them transition from traditional to online learning.

There are not sufficient technology courses in special education teacher preparation programs. There has been a significant shift in educational philosophy related to online instruction that has been overlooked in teacher education (Korkmaz and Toraman, 2020). More technology courses should be included in teacher preparation programs for special education teachers, according to six studies, to cover a range of tools that can be helpful (Alanazy & Alrusaiyes, 2021; Burke & Hughes, 2018; Demirok & Baglama, 2018; Kaczorowski et al., 2019; Ozdamli, 2017; Siyam, 2019). Alanazy and Alrusaiyes (2021) found that preservice special education teachers know computer applications but lack the skills to integrate them into their teaching in a study with 58 preservice special education teachers. Technology courses should be improved in teacher preparation programs for special education teachers, focusing on integrating technology (Alanazy and Alrusaiyes, 2021; Demirok and Baglama, 2018).

There should be accessibility when using technology with students with disabilities. The Individuals with Disabilities Act (IDEA) mandates that technology be accessible to students with disabilities and that assistive technology be used (Atanga et al.

2020). Online learning can frustrate students and make them feel bad if poorly designed (Van Garderen et al., 2020). Atanga et al. (2020) reported in one study that teachers were interested in using assistive technology but felt their training program did not adequately prepare them to do so. Assistive technology courses are essential for increasing a teacher's knowledge of assistive technology and understanding the barriers encountered (Atanga et al., 2020).

Collaboration With Families

Parent and teacher collaboration is critical in online learning for students with disabilities. Parent-teacher collaboration is essential due to the support that students with disabilities require in online learning and its impact on the services they receive (Akbayrak et al., 2021; Alvarez-Guerro et al., 2021; Ayda et al., 2020; Collier et al., 2017; Supratiwi et al., 2021). Supratiwi et al. (2021) found that online learning for students with disabilities required parental assistance, especially at the elementary level, in a study with 226 special education teachers. Teachers went above and beyond to foster a sense of school unity by encouraging collaboration. Working one-on-one with parents, special education teachers encouraged collaboration by sharing critical strategies for working with students with disabilities (Lambert & Shuck, 2021; Page et al., 2021; Shuck & Lambert, 2020). Working with parents through online learning is a great way to improve parent-school communication (Lambert and Shuck, 2021).

There is a lack of collaboration between parents and teachers for online learning. Since the pandemic, there has been a mix of parents' and teachers' inability to communicate online learning for students with disabilities (Couper-Kenney & Riddell,

2021; Parmigiani et al., 2021; Yazcayir and Gurgur, 2021). Azano and Tackett (2017) and Couper-Kenney and Riddell (2021) found that families found online learning challenging due to a lack of knowledge and communication between home and school in two studies. It was also discovered that, even though some parents contacted the school for assistance, the school was not the first to respond. One parent also stated that her regular education child's teacher was reaching out first, as opposed to her son's teacher, who has a disability (Couper-Kenney and Riddell, 2021)

In another study, Steed and Leech (2021) reported that some families would not contact special education personnel to schedule services for their children because they believed it was the school's responsibility to contact them. Parmigiani et al. (2021) report that some parents wanted to be involved, while others did not because they felt inadequate in working with their child in online learning in another study with 785 special education teachers. Parmigiani et al. 2021 proposed bridging the digital divide by providing technical and educational support to parents. Online learning for students with disabilities can be successful with parental support, but it can also be unsuccessful without it.

Professional Development

Professional development is essential to work with students with disabilities in online learning. Teachers shifted their duties and responsibilities from the classroom to primarily online instruction without proper training at the start of the pandemic (Cavanaugh & DeWeese, 2020). Professional development prepares special education teachers to work with students with disabilities online by focusing on individual

experiences, providing training in best practices and expanding their knowledge of how to make online learning more accessible (Bornet-Ringleb et al., 2021; Love & Ewoldt, 2021; Trust & Whalen, 2020; 2021). Alshamri (2021), in a study with 15 teachers, reported that teachers were having difficulty using online technology at the start of the pandemic. Teachers were underprepared, so they were doing double duty by learning about virtual learning and communicating it to students with disabilities (Alshamri, 2021). These teachers enrolled in summer professional learning courses to prepare for the upcoming school year and found themselves more at ease (Alshamri, 2021). It is critical to understand the resources and support special education teachers require through online learning to develop practical professional development strategies (Cavanaugh & DeWeese, 2020; Gudmundsdottif & Hathaway, 2020). This is an aspect that I should consider in my study.

There is a lack of training opportunities for teachers to work with students with disabilities online. It has been reported that up until recently, teacher training has primarily focused on in-person instruction (Allen et al., 2020; Cavanaugh and DeWeese, 2020). Teachers in special education do not have adequate technical training and require professional development to address and improve their abilities to teach students with disabilities online (Anderson and Putman, 2020; Cagiltay et al., 2019; Sabayleh and Alramamneh, 2020; Smith, 2020). Mohamed (2018), in a study with 428 teachers, found that special education teachers used technology positively. However, they require more computer technology training in the classroom and a more systematic approach to using it effectively. Trust and Whalen (2020) found that teachers felt overwhelmed and

unprepared to use online strategies and tools in a study of 325 teachers. These educators were having trouble adapting their pedagogy to various online environments and desired more technology training.

School leaders should ensure that teachers get adequate training and resources to teach students with disabilities online. To achieve the desired outcome with technology, school leaders must ensure that teachers have the specific tools and training tailored to their role, particularly pedagogy (Steed & Leech, 2021; Sulaimani, 2017). Teachers must also receive training as new technology becomes available, benefiting students with disabilities (Sulaimani, 2017). Love and Ewoldt (2021) emphasize the importance of delivering special education online and providing more pre-service and in-service teachers' training. Fraser et al. (2020) found that it can be ineffective if professional learning is not followed up on because teachers need more technology practice than once. Ayda et al. (2020) conducted another study with ten special education teachers, asking them to assess the impact of online learning on students with disabilities. These teachers believed they lacked experience working with disabled students and did not know how to use student IEPs online. All formats for online instruction and alternatives to online teaching must be considered to ensure that students in a digital special education program have access to the required intervention (Medwetz et al., 2021).

Summary and Conclusions

This chapter provides a comprehensive review of the literature that will be used to guide this study. The review started with a selection of studies discussing Rogers's (2003) theory of diffusion and the concerns-based adoption model (Hall et al., 1973). The

theory and framework guide the investigation of the research problem. The next nine sections reviewed studies related to the study problem and purpose. The sections include literature discussing self-regulation, lack of online access, collaboration, accommodations and modifications, universal design for learning, guidance, teacher preparation programs, collaboration with families, and professional development. Studies focusing on teaching synchronously are mentioned in the literature as something that needs to be explored. The literature's final sections concentrate on the most recent supports and strategies required for online learning by students with disabilities. A discussion of professional development in relation to the subject of the study and its importance was included in the final section. Only a small number of studies have explored online learning in elementary schools, and none have explored how elementary special education teachers feel about the move to online learning for students with disabilities. These sparse results highlight the need for more investigation into elementary special education teachers' perspectives of online learning. The literature review supports the need to explore elementary special education teachers' perceptions of their pedagogical and technological concerns regarding the transition to online learning for students with disabilities, which also supports the study's qualitative focus. The discussion of the researcher's role, participant selection, data collection, data analysis, trustworthiness, and ethical procedures will be presented in Chapter 3.

Chapter 3: Research Method

The purpose of this basic qualitative study was to explore elementary special education teachers' perceptions of pedagogical and technological concerns about the shift to online learning for students with disabilities in a school district in the southeast United States. In this chapter, I discuss the research questions, research design, and rationale for using a qualitative approach in this study. Then I describe my role as a researcher, the methodology adopted in the study, participant selection, instrumentation, data collection and analysis, study reliability, and ethical procedures. These critical elements are summarized at the end of this chapter.

Research Design and Rationale

The following research questions guided this study:

RQ1: What pedagogical concerns do elementary special education teachers at a school district in the southeastern United States have related to the shift to online learning for students with disabilities?

RQ2: What technological concerns do elementary special education teachers at a school district in the southeastern United States have related to the shift to online learning for students with disabilities?

RQ3: What are the problems and issues faced by the teachers when implementing online learning with students with disabilities?

I used Rogers's (1995, 2003) diffusion theory and the CBAM (Hall et al., 1973) as the conceptual framework of this study. The five attributes of Rogers's diffusion theory helped to determine how elementary special education teachers view the transition

to online learning. The concepts of the LOU and SOC were used in this study as part of the CBAM. Individual behavior and course of action are identified by the LOU, while the SOC focus on individuals in the change process by obtaining their perceptions of the change occurring. These central concepts helped me answer the research questions and learn more about the perspectives of elementary special education teachers regarding the transition to online learning for students with disabilities.

Based on the study's purpose and research questions, I chose to employ the basic qualitative research design. Researchers who take a qualitative approach are interested in learning more about people's experiences and perspectives and how they interpret those experiences (Ravitch and Carl, 2016). Open-ended interviews and document analysis are two methods that are used to collect data in a basic qualitative study, with more focus being placed on the interviews as the primary collection method (Merriam and Tisdell, 2016). In a qualitative research design, researchers have no prior knowledge of the topic and use the flexible design to gain a more profound and detailed understanding of the individuals' experiences and perceptions, paying more attention to their experiences (Patton, 2015). I had no prior knowledge of the elementary special education teachers' thoughts on the shift to online learning or the findings that would emerge from this study.

Role of the Researcher

As a researcher, it was my responsibility to collect, analyze, and synthesize data to answer the research questions and report the results accurately and without bias (see Rubin and Rubin, 2012). Because the researcher's approach, biases, and opinions can significantly impact the data collection and interpretation, the role the researcher plays is

critical and significant in the data collection process (Ravitch and Carl, 2016). If the researcher is an insider with the knowledge to shape the research, they gather information (Ravitch and Carl, 2016). As a qualitative researcher, it was my responsibility to close the gap in practice by gaining a thorough understanding of the subject.

I currently work as a certified special education teacher in one of the study site school district's 11 elementary schools. At the time of the study, I did not have supervisory duties over the elementary special education teachers at the other elementary schools or did I hold a leadership position at the elementary school where I work. My enthusiasm for the use of technology in special education had the potential to cause bias. To mitigate this possible bias, I kept reflective journals and took thorough notes while collecting data. A researcher can work reflectively by keeping a reflective journal (Patton, 2015).

Methodology

I used in-depth interviews to collect data for this basic qualitative study. A basic qualitative study examines how people interpret their own experiences (Merriam, 2009). In this section, I discuss participant selection and instrumentation, procedures for participant recruitment, the data collection process, and data analysis plan.

Participant Selection

10 elementary special education teachers from a local school district in the southeastern United States participated in this study. I recruited the participants using purposeful sampling. When selecting participants for a basic qualitative study, the most

common method used is purposeful sampling (Patton, 2015). In purposeful sampling, the researcher can choose cases that provide information (Patton, 2015).

I chose the participants from a pool of elementary special education teachers from the local school district's 10 elementary schools via the school's email system. The participants' email addresses could be found on the school system's special education website in the personnel section. Participants were chosen based on whether they currently or previously taught students with disabilities online. The first 10 teachers who responded to the initial invitation were selected as participants, but I preserved information about three or four other participants as well with the intention of using them in case any from the first selected 10 participants decide to drop out from the study. However, I believed by the time I completed the interviews with the first selected 10 participants that data saturation would occur. According to Patton (2015), saturation occurs with between six and 12 participants.

To ensure that participants met the criteria for participation in this study, I asked them to respond to the email invitation and answer the following questions to confirm their eligibility:

- Do you currently provide online instruction for students with disabilities?
- Did you provide online instructions for students with disabilities last year?

Instrumentation

I used semi structured interviews with open-ended questions that were directly related to the research questions to collect data for this study. If the necessity arose to ask more questions during the interview, I was at liberty to use more interview questions (see

Rubin and Rubin, 2012). By obtaining participants' perceptions of the change, I used the CBAM's LOU and SOC to identify and focus on participants' behavior in the change process. The CBAM was used in conjunction with Rogers's (1995, 2003) diffusion theory as the framework for the development of the interview questions and data collection. Interview protocols, semi-structured interview questions (see Appendix), consent forms and interviewee recordings were additional instruments used in this study. After the participants had given their consent, I invited them to choose an interview time. As soon as the interview began, participants were informed that they would be audio recorded and were reminded that they could opt out of participation at any time.

Procedures for Recruitment, Participation, and Data Collection

I received approval from the Walden University Institutional Review Board (IRB) and the school district to conduct the study before I began recruiting participants. The participants were drawn from 10 of the study site district's 11 elementary schools. Participants were elementary special education teachers who currently or previously taught disabled students online. After completing the consent form I sent individual participants information about selecting a time slot for the video interview. If participants were unable or unwilling to participate in the video interview, a phone option was offered.

Video conferencing with no video and only audio recording was used to record the interviews. I transcribed the interviews to look for relevant themes to the research questions. Participants were advised to set aside some time at the end of the interview for additional comments. Interviews lasted between 30 and 45 minutes. After each interview,

a copy of the interview transcript was emailed to the specific participant to ensure accuracy. All participants received a thank you email for participating.

Data Analysis Plan

The purpose of this qualitative study was to explore the perceptions of elementary special education teachers in a school district in the southeastern United States of their pedagogical and technological concerns regarding the shift to online learning for students with disabilities. The use of inductive analysis is essential for any naturalistic inquiry study (Patton, 2015). The interviews were transcribed, and I relistened to the audio recording of each interview to ensure that the transcription was correct. I placed the interview transcriptions into a Microsoft Word document. The transcriptions were then coded to find keywords, themes, and phrases (see Rubin and Rubin, 2012). The first cycle of coding ranged from a single word to a complete sentence, while the second cycle of coding was based on extended passages or a reconstruction (see Saldana, 2016). Thematic descriptions for data analysis required several coding iterations (see Patton, 2015). I made handwritten comments and coded each interview transcript.

I reviewed my notes, listened to the audio recordings of the interviews, and read the transcripts to address any discrepancies in the data. Any inconsistencies discovered during the data collection and analysis process were appropriately documented and included with the findings. If I discovered any inconsistencies, I contacted the participant to clarify the specific area where the inconsistency existed (see Patton, 2015). The negative case had to stand alongside each round of coded data if the data appears to be accurate after checking with the participant (see Ravitch and Carl, 2016). According to

Ravitch and Carl (2016), a negative case could contradict the main findings and strengthen the study's credibility.

Trustworthiness

All qualitative researchers should provide transparency (Patton, 2015). The reader's interest is piqued by capturing the working environment and participants' experiences and insights (Ravitch and Carl, 2016). The four essential criteria for determining trustworthiness are credibility, transferability, dependability, and confirmability (Saldana, 2016). In this section, I discuss how the criteria for credibility, transferability, dependability, and confirmability were achieved in this study.

Credibility - Through engagement, observations, and triangulation, the credibility of the data is established, contributing to the overall quality of trustworthiness. Triangulation is a trustworthiness tactic that entails using various data gathering methods to assemble multiple perspectives (Ravitch and Carl, 2016). To establish credibility, I collected and analyzed data using various methods, including semi structured interviews, reflective journals, detailed notes that were taken throughout the process, and peer-review feedback. Another way credibility was established was by interpreting the interview data focusing on the study's purpose and research question.

Transferability - Thick descriptions and maximum variation support transferability (Merriam and Grenier, 2019). To ensure transferability, it was critical to share how I conducted this study, including the selection of participants, data collection methods, time, and limitations. To ensure transferability, I provided the specifics of this study, including any potential limitations,

Dependability is necessary to ensure that the research is of high quality and could be replicated with similar results (Ravitch and Carl, 2016). By creating an unbiased interview guide, a researcher can establish validity (Patton, 2015). Valid data is required to ensure that the study's findings can be confirmed. I used semi structured interviews with follow-up questions in this study, and the interview questions (see Appendix) were aligned with the research questions to obtain detailed descriptive data.

Confirmability ensures that the data gathered meets the researcher's objectives (Ravitch and Carl, 2016). Maintaining objectivity as I transcribed and analyzed the data was important for establishing confirmability. I transcribed the interviews so that the perspectives of the elementary special education teachers of the shift to online learning were accurate and precise. Asking follow-up questions allowed participants to double-check their answers. The participants were allowed to look over the transcripts of their interviews to ensure that the data and my analysis were accurate. In addition, I worked with my committee members to discuss feedback on the study's processes and methods.

Ethical Procedures

Before any participant recruitment or data collection could begin, I received approval from the Walden University IRB (06-14-22-0997561). I also contacted the school improvement and assessment director for approval before starting the data collection process. The research topic was clearly described in the recruitment email. All participants had to provide informed consent, which informed them of their rights and obligations in the study. I reminded participants that they could refuse participation or

withdraw from the study at any time during the process. The participants were referred to as P1, P2, etc. instead of by their real names to protect their identities.

Summary

In this chapter, I provided the study's research design and rationale, the role of the researcher, methodology, instrumentation, participant selection procedures, data collection, data analysis, trustworthiness, and ethical procedures. I conducted this preliminary qualitative study with 10 elementary special education teachers who met the study's participant eligibility requirements. The participants were recruited through purposeful sampling. The study's conceptual framework was based on Rogers's (1995, 2003) diffusion theory and the CBAM (Hall et al., 1973). Data were gathered through semi structured interviews to learn more about how elementary special education teachers feel about the shift to online learning. The study's findings are presented in Chapter 4. The setting, data collection, data analysis, results, evidence of trustworthiness, and a summary of the results are discussed as well in Chapter 4.

Chapter 4: Results

The purpose of this basic qualitative study was to explore the perceptions of elementary special education teachers in a school district in the southeastern United States of their pedagogical and technology concerns regarding the shift to online learning for students with disabilities. The following research questions guided the study:

RQ1: What pedagogical concerns do elementary special education teachers at a school district in the southeastern United States have related to the shift to online learning for students with disabilities?

RQ2: What technological concerns do elementary special education teachers at a school district in the southeastern United States have related to the shift to online learning for students with disabilities?

RQ3: What are the problems and issues faced by the teachers when implementing online learning with students with disabilities?

In this chapter, I discuss the research setting, participant demographics, data collection, analysis, and trustworthiness concerns. Finally, I examine the results related to each research question.

Setting

This study was conducted on the Google Meets virtual platform. I conducted interviews in my home office to reduce distractions and background noise. In addition to 11 elementary schools, three middle schools, three high schools, and three middle schools, the study site school district has two vocational academies and one alternative school. The district had over 12,000 students enrolled at the time of this study, with more

than 5,900 of those students attending elementary schools. There were 1,351 enrolled students with an IEP with services, with elementary schools accounting for half of that total. When the COVID-19 pandemic began in March 2020, all elementary special education teachers were mandated to give their students online instructions. 4

I asked the participants to share their years of experience and the area of special education in which they specialize to better understand their perspectives. The participants' experiences varied between 4 and 30 years of service. As resource teachers, P2, P3, P5, P6, and P7 support students with disabilities in the general education classroom or pull students out of the class to work in a special classroom. P1, P4, P8, P9, and P10 are self-contained teachers, which means they are responsible for caring for children with mild to severe cognitive, adaptive, and behavioral needs who cannot be served in a general education classroom. The demographic data for each of the 10 participants are shown in Table 1.

Table 1

Research Participant Demographics

Participant	Gender	Special Education Specialization	Years of Teaching
P1	Female	Self-contained	5
P2	Female	Resource	30
P3	Female	Resource	14
P4	Female	Self-contained	20
P5	Female	Resource	6
P6	Female	Resource	9
P7	Female	Resource	10
P8	Female	Self-contained	9
P9	Female	Self-contained	12
P10	Female	Self-contained	4

Data Collection

Using semi structured virtual interviews, I collected data from 10 elementary special education teachers. The inclusion criteria were that participants must have experience teaching students with disabilities online and should be elementary special education teachers. District email addresses were used to contact every participant. I sent an invitation to participate in the study to all the district's elementary special education teachers. If they expressed interest, I provided them with the informed consent form and a brief, in-depth explanation of the study. Ten special education teachers who taught the elementary school students met the requirements and expressed interest in participating in the study. I scheduled the interviews with these teachers as their consent forms were coming in.

All interviews were completed between June 16, 2022, and June 23, 2022. I reminded the participants at the start of the interviews that their participation in this study was entirely voluntary and that they could terminate their participation at any time. I also reminded the participants that as a mandated reporter, I was legally required to report any instances of child abuse or neglect. The participants were informed that the interviews would be audio recorded on Google Meets without the video portion of the platform being recorded and that the recordings would only be saved as audio files. Although no video would have been used in any case, I asked the participant if they wanted the video on while only the audio was recorded.

All interviews were semi structured and adhered to the interview guide's themes and the conceptual framework based on the diffusion theory and CBAM. Each question

had a follow-up question, but four times the follow-up question was unnecessary because the participants provided enough information in response to the initial questions. The interview questions were created to learn more about the perspectives of elementary special education teachers on technology adoption in the transition to online learning for students with disabilities. At the end of each interview, I asked the participants if they had any additional comments about online learning and students with disabilities.

After conducting the interviews, I reviewed the transcripts and listened to each interview at least three times to make corrections. Participants were given a copy of the transcript to double-check the accuracy of their responses. To protect their identities, I gave each participant a pseudonym (i.e., P1, P2, P3, etc.). The transcripts and audio recordings were used when analyzing the study data. The audio recordings of the interviews are saved on my personal, password-protected computer and later transferred to an external hard drive, which will be kept in a locked cabinet in my home office for 5 years per Walden University protocol. After 5 years, I will delete all recordings and transcript copies following Walden University protocol. Only I have access to the password-protected electronic files, external hard drives, and file cabinets containing paper copies. During the data collection process, I encountered no unusual circumstances.

Data Analysis

In this basic qualitative study, I collected data by conducting semi structured interviews, which were later transcribed, analyzed, coded, and categorized to identify emerging themes. I used thematic inductive coding to better understand elementary special education teachers' perceptions of technology adoption in online learning for

students with disabilities. According to Nowell et al. (2017), researchers must search through the data to find specific and repeated patterns within the data set.

I compared the audio recording transcripts to see if there were any discrepancies. After transcribing the interviews, I coded the unit of meaning to find keywords and phrases. When inductive coding, interviewers assign codes to words or phrases that appear to stand out while looking for patterns or categories (Saldana, 2016). After reviewing and reconstructing all the themes, I created a matrix representing the interview codes, categories, patterns, and themes aligned with the research questions and framework. The initial code count from the initial coding phase is shown in Table 2.

Table 2

Initial Code Count

Phrase Count				
	Able (56)	Needs (57)	Collaboration (15)	Google (22)
	Academic (7)	Manipulatives (7)	Completing (6)	Guidance (12)
	Access (14)	Flexible (20)	Consistent (8)	Home (12)
	Adapt (11)	Online (117)	Content (10)	Help (29)
	Aspect (12)	Parents (69)	Curriculum (5)	Hands (7)
	Assignment (6)	Planning (12)	Delivering (14)	Synchronous (12)
	Assistance (6)	Platform (20)	Different (47)	IEP (20)
	Assumption (6)	Programs (42)	Difficult (24)	Instruction (22)
	Attention (9)	Prepared (13)	District (9)	Interaction (15)
	Available (5)	Services (15)	Disabilities (56)	Learning (84)
	Beneficial (11)	Specialized (25)	Distraction (6)	Logging (17)
	Challenges (43)	Training (19)	Elementary (15)	Meetings (24)
	Chromebooks (13)	Virtual (46)	Follow (23)	General (10)
	Classroom (30)	Special (31)		Progress (15)

Patterns

Following the first coding cycle, I synthesized the codes by combining them to create patterns and categories using pattern coding (see Saldana, 2016). The second coding cycle, known as pattern coding, divides initial data into more manageable themes (Saldana, 2016). I created patterns using the initial codes after analyzing them. I employed patterns consistent with the study's conceptual framework and research questions. The patterns that resulted from the codes are displayed in Table 3.

Table 3

Patterns From Initial Code Count

Patterns	Initial Codes			
Pedagogical Concerns	Academic Adapt Aspect Assignment Progress	IEP Instruction Interaction Learning Meetings	Needs Online Parents Synchronous Disabilities	Available Attention Different Difficult Distractions
Technological Concerns	Assumptions Basic Chromebooks District Google	Help Development Professional	Virtual Specialized Parents	Training Platform Compliance
Problems and Issues	Assistance Parents Collaboration Completing	Curriculum Guidance Synchronous	Planning Programs Planning	Logging Content Consistent

Results

In this section, I discuss the themes related to elementary special education teachers' perceptions of technology adoption during the shift to online learning in teaching students with disabilities. I included quotes from the 10 participants' transcripts to support each theme. Using a basic qualitative design, data to address the research

questions were collected through semi structured interview questions. Table 4 shows the themes that emerged from the research questions.

Table 4

The Connection Between Research Questions and Themes

Research Question	Themes
RQ1: What pedagogical concerns do elementary special education teachers at a school district in the southeastern United States have related to the shift to online learning for students with disabilities?	Instruction Compliance Resources Progress monitoring
RQ2: What technological concerns do elementary special education teachers at a school district in the southeastern United States have related to the shift to online learning for students with disabilities?	Use of technology Lack of training Specialized training Parent training
RQ3: What are the problems and issues faced by the teachers when implementing online learning with students with disabilities?	Synchronous Self-regulation Guidance Lack of online access

RQ1

Data analysis concerning RQ1 yielded the following themes: resources, progress monitoring, instruction, and compliance (see Table 4). I asked participants to describe how their teaching experiences influenced their online teaching with students with disabilities. In addition, the participants also shared their perspectives on the problematic aspect of adapting their instruction for students with disabilities for online learning as opposed to in-person learning.

Resources

According to participants' interview responses, one of the areas of concern was the application of resources from in-person learning to online learning to meet the needs of their students. P1, P2, P4, P6, P8, and P9 believed some of their students had difficulty because they were so accustomed to hands-on learning. According to P3,

> whether online or in-person, we need to be able to use a lot of different resources and a lot of different modes of teaching because some are more auditory learners or some need a lot of hands-on to be able to grasp the skill.

This applies whether the instruction is being delivered online or in person. P7 stated that:

> It was challenging because many of our classroom resources can manipulate and move things. That was not possible through our online platform. The format consisted primarily of making guesses and hoping for the best. It was almost as if you were taking an existing curriculum and creating an entirely new one for it to be completed online.

Progress Monitoring

The participants' responses indicated that a primary area of concern in the online setting was the practice of progress monitoring. As stated by P8, "it is challenging to determine whether or not the student understood the assignment to collect data for progress monitoring." P10 stated that

> Progress monitoring was difficult to do with her self-contain students online because of the hands-on approach that is needed with them and that it is up to the parent to take what you are teaching and kind of use it at home.

With regard to the same issue, P7 indicated that

> It was difficult for her to accurately monitor the students' progress because she could not always see what they were doing. It was harder to know if, like the parents were prepping or telling them something in their ear or if the parent had written something down and prompted them to the correct answer. Some students struggled with some concepts but got them online.

Instruction

The responses given by the participants during the interviews indicated that providing instruction in an online setting is an area of concern. Each participant reported that their prior understanding of special education benefited them while navigating the online learning component. P10 said, "Because it was her second year during Covid, she had very little knowledge about special education, but she knew the basics. “According to P10, "...it is difficult for students with disabilities to get what they needed in such a short amount of time over virtual, and that she was focused on implementing the direct instruction piece, which included repetition." P2’s response was:

Before the year 2020, I did not use technology in any particular way other than small group assignments while working with a group, and as an experienced special education teacher of 30 years, it was a learning curve for me.

P4 said that:

> My knowledge of the special education population has been helpful with the transition to online learning. Building a rapport with the parent was useful because it was a learning curve for everyone. Currently, I am learning how to adapt the tools to online learning, which has been a learning curve for everyone.

Compliance

The responses given by the participants in the interviews pertaining to this issue indicated that compliance was a topic of concern in the online setting. P1 mentioned that "trying to conduct IEP goals online while trying to stay compliant with the state and federal guidelines was very interesting." Another point that P1 mentioned was that "the goals from the IEPs were met for in-person learning, so it was very challenging to provide accurate data." P7 implied that:

> There should be a way to check in with students and see what they are doing in real-time. Writing and hands-on samples, as well as a method to integrate the instructional component in technology, determine whether students successfully achieve their goals.

All participants suggested that there should be some sort of training on carrying out IEPs in virtual environments like the internet.

RQ2

Data gathered in relation to RQ2 yielded the following themes: use of technology, lack of training, specialized training, and parent training (See Table 4). Participants were asked about how their use of technology impacts the way they deliver online instruction to students with disabilities. The participants shared what kind of technology they had used before and information pertaining to how much training they have received and how elementary teachers could be better prepared to deliver online instruction to students with disabilities.

Use of Technology

The interviews revealed that participants' use of technology influenced the instruction they delivered. All participants mentioned technologies were Chromebooks, laptops, and Promethean boards. They did not begin online instruction until the beginning of Covid-19, when it was required. P3, P5, P7, and P10 demonstrated an excellent understanding of technology. P10 pointed out, "Being a young teacher, I understand technology better, so I had an advantage in that aspect." P10 pointed out further that "It was simply a matter of working on my end and then coaching the parents on their ends to make it more beneficial." P5 revealed, "I was able to create student pages and hold online meetings." P7 disclosed, " I rely heavily on technology to reinforce what I teach in direct instruction, such as using boom cards and teach my monster to read." P3 said:

> Google Meet includes a Jam board for all participants to write on. I've uploaded base ten pieces to Google Docs so that both of us can manipulate them at the same time. I try to draw from various sources and employ techniques based solely on the needs of the students and the skills they are learning.

P1, P2, and P6 stated that using technology in online learning has been a learning experience for them. P2 responded, "as a 30-year veteran; it was a learning curve." P2 also stated, "I was doing a lot of extra work on my own to keep up with the technology. It is not my preferred method, so I did not use it as frequently as other teachers when assigning morning work to students." "I pretty much learn and teach the technology to the students," P6's comment was "I try to find the most straightforward way for us to deliver the lesson to them without having to conduct one." "I would send videos to parents to show them how to log on and what we are doing." P1 denoted that -

> Because I am not particularly tech-savvy, I had to learn as we progressed through the virtual learning period. Getting and keeping students engaged with technology was difficult because some students have special needs that prevent them from doing things like clicking or touching something on their own.

Lack of Training

The responses from the participants to the interview questions related to training indicated that a lack of training to facilitate online learning for students with disabilities was a cause for concern. During their interviews, every participant mentioned that they either did not have any training or had insufficient training to teach students with disabilities who learn online. P1, P2, P4, P5, P7, P8, P9, and P10 all claimed that the training by the district dealt only with how to use the canvas platform. According to P5 and P7, the training was not geared towards special education. P5 explained her response by saying, "I have been seeking professional which l development opportunities so that I would not be caught off guard." P1 stated,

> It was just a matter of trial and error, the student's disability does make a difference because some of them will have difficulty doing everything you ask, while others will do everything they can while the others require assistance from their parents.

According to P2 it was assumed that special education teachers knew how to provide online instruction to the students in the class. P3 stated "...I did not receive any training. It is a great blessing that the virtual academy is nearby so that I can ask questions."

Specialized Training

The responses were given by participants during the interviews also mentioned about specialized training. They suggested that specialized training is necessary to facilitate online learning for students with disabilities. According to the opinions expressed by P3, P4, P5, P6, and P8it was apparent that they all agreed that specialized training is required. Referring to this issue, P10 said:

I think more specialized instruction and training is needed from the self-contain point of view because needs are different from resource and regular education student who can work independently without parent guidance which is not the case for self-contained. In addition, the importance of specialized instruction over broad general training.

The response from P3 was that they provide "professional development and specialized training for best practices for teaching students with disabilities online." P3 also stated that "the training should have specific examples about what works and what does not work in the online environment for students with disabilities." P2 responded, saying, "it should not be assumed that all students can use the platform effectively." These statements implied that it should be possible for students with disabilities to participate in a dedicated program that provides easy access to the material. P4 suggested that those educators in the district who are skilled in delivering online instruction to students with disabilities should serve in a coaching capacity for those educators in the district.

Parent Training

The responses given by the participants during the interviews suggested that training for parents is an area of concern regarding the online education of students with

disabilities. P1, P5, P6, P8, and P9 believe that parents with a child with a disability should participate in appropriate parent training. P9 suggested that "parents should be required to come into the school for a couple of days to learn the programs, platforms, and how to log on and to know what their child would be learning." According to P6, parent training can assist parents in better comprehending what their children are learning online. P1 offered her response, which was as follows: "parents need to know the importance of virtual for their child, and it must be a team effort and should not fall solely on the teacher."

RQ3

RQ3 data analysis yielded the following themes: synchronous, self-regulation, guidance, and lack of online access (see Table 4). Participants were asked to describe challenges they faced while planning and implementing online learning. The participants shared their viewpoints related to how they resolved some of the challenges. The participants also shared whether they sought assistance from other elementary special education teachers.

Synchronous

The interviewees' responses indicated that synchronous was a concern when conducting online learning. P1, P2, P4, P8, P9, and P10 believe that having to do online learning during school hours and teaching in person and online at the same time was extremely difficult. P8 implied that "it was difficult to try to provide instruction while managing two different environments at the same time." P1 also expressed dissatisfaction with the parents' consistency in logging in at the designated time. She added that "it was

difficult to get everyone to log in at the same time when teaching in-person students to have a productive, meaningful dialogue when people were in their homes," P2 said. "some students with the executive functioning disorder could not remember or use their names to log in," P2 explained the issue further when she said, "if I say I'll meet you at Google Classroom, they were on canvas. Then they didn't know how to get to the clever program, and then they couldn't get to the next place."

Because of the needs of the specific disability, all participants stated that teaching online and in-person was difficult. They expressed their opinion that the students and parents did not log on at the designated time, and the students sometimes never log on or log on when they wanted to. P9 explaining this also stated, "This made it difficult to teach in person and online simultaneously." P2 explaining the situation further stated- I believe that having the kids log on and see a teacher and possibly another kid on a Google Meet page was beneficial. Still, due to a lack of academics, they could not log in, attend a class, and produce what was expected at the end of the session. I never imagined that online learning could be academically beneficial without guidance and support.

Self-Regulation

The concept of self-regulation is another important aspect that emerged from the data related to research question 3. The responses of interview participants to this indicated that the online self-regulation of students with disabilities was a concern. P9 responded, "students needed face-to-face interaction, and the biggest issue was a lack of assignment completion.” some of her students and even parents did not know how to access a Chromebook.P10 explained, “If the parents did know, they could not help

because they had to work". P1, P3, P6, P7, and P8 believe that the student-specific disability made a difference because some students needed hands-on assistance or someone to accompany them to participate as much as possible. P7 explaining it, further stated that one of her hands-on students struggled online, and she had to do trial and error to meet his needs. P10 said, "I don't want to say it's useless because it has a mass effect and can be good; just keeping them on a routine would improve student learning outcome."

Participants perceived distractions as a concern when attempting to conduct online learning. According to P6, "distractions at homemade online learning difficult." P6 contributed to this aspect by saying, "making sure parents are aware that their child is distracted a challenge because some of the parents had limited space and were working from home or they had things to do and couldn't be sure were paying attention,". P1, P3, P8, and P9 all believe that students had difficulty paying attention online more than in person. P3 stated that she had some students falling asleep and that no parents were present to prevent this. According to P3, "some students have a sibling or other family members moving around the house, making it difficult to hold their attention when other things are happening around them." According to all participants, when you look at them on the screen, and they are alone, it is more difficult to get them back on task. According to P5, "I might call their name to get their attention, and I believe I spend a lot of time trying to get their attention." P1's belief is that "it is better one-on-one to get their attention better, but it depends on the size of that special education case load." P2 stated that "some students with the executive functioning disorder were unable to remember or

use their user names to log in." P2 explained, "If I say I'll meet you at Google Classroom, they were on canvas, and then they didn't know how to get to the clever program, and then they couldn't get to the next place."

Guidance

The interviews revealed that participants were concerned about guidance on conducting online learning for students with disabilities. All participants stated that at the start of the pandemic, they were told to do their best online by collaborating with service providers and parents through a distance learning plan when it was stated that the district should find a platform that the students are familiar with so they can easily access the content. Commenting on this P2 responded. "Some students with disabilities have a hard time learning in-person, and online adds another area of difficulty for them," P3 also mentioned, "knowing best practices for ensuring that I am continuing to help grow and learn on an online platform."

All participants indicated that they collaborated with other elementary special education teachers within the district. P5, P8, and P9 all mentioned in their responses that they had shared educational resources with others and inquired about what accommodations were being made for specific disabilities. P10 commented saying, "I ask other teachers in the district about how they were implementing online learning, as well as other teachers in self-contained classrooms, about how they were implementing it with their students." P10 mentioned that "it was more problem solving within our classroom." P2 explained how she reached out to other educators to inquire about the level of online success they were experiencing. P3 revealed the team's reactions and stated, "the team

would ask me, "Have you tried this or listened to something they had success with? It has been beneficial to me; it might not be helpful to my students, but it has been helpful to me." P1 also said,

I collaborated with other special education teachers and the teachers of the virtual academy in the building. Since I am not very good with technology, I often ask for assistance within the building and inquire about what other people do with it

Lack of Online Access

The responses given by the participants during the interviews suggested that some students with disabilities do not have access to the internet. P10 said, "Many of her students did not have the internet at home, and if they did, the parents were working, so they could not access online at the required time frame." P1, P2, P3, P7, P8, and P9 all agreed that the school's or the parents' WIFI connection would occasionally become unavailable. P9 divulged the following: "if the video platform did not work, she would have to call the parents to reschedule, and sometimes they would not show up, like forgetting about the online session." It was suggested by participants P1, P2, P5, P6, and P7 that teachers should make weekly learning packets available for students to pick up and that teachers should be available to answer any questions from the parents. In addition, online supplemental resources should be made available.

Evidence of Trustworthiness

As discussed in Chapter 3, trustworthiness in a study is demonstrated when the researcher identifies how credibility, transferability, dependability, and confirmability are

achieved in the study and that the conclusions and findings are meaningful and valuable enough to be applied in other settings.

Credibility

Credibility refers to the confidence in the truthfulness and findings of a study. Participants reviewed their interview transcripts for accuracy and any critical information that may have been overlooked to gain credibility. After each interview, I wrote a memo in my reflective journal. I used the journal while doing peer review to keep track of potential biases as a researcher and best practices for reflective writing (Patton,2015). My debriefing partners were aware that I was a special education teacher in the district and knew some of the elementary special education teachers. While discussing the early findings from the interviews, my debriefing partners pushed me to analyze whether I was concluding the ten interviews or from any prior knowledge of the topic or the participants. I kept interviewing people until I felt I had reached data saturation. I feel that the above steps I vehemently followed helped to establish the credibility of my study

Transferability

Transferability is the study's ability to be applied in other contexts or with other respondents (Siegle, 2019). In the background section of chapter one, I outline a detailed description of the setting of this study for the reader's context. In table one, the participants' characteristics were fully described for transferability in the setting section of chapter four. The method for identifying and choosing participants, reiterated in the following paragraph, would further support my study's transferability.

I contacted the district's school improvement and assessment director for permission to conduct my research.I then used the district special education website to find elementary special education teachers' email addresses to send them an invitation and my screening questions via email. I scheduled the interviews after identifying a pool of potential participants. The interviews were audio recorded and secured. These steps described above would facilitate the transferability of the methods and the strategies adopted in the study as well as the findings to any other similar setting.

Dependability

Dependability is necessary to ensure that the research is of high quality and could be replicated with similar results (Ravitch and Carl, 2016). I created an unbiased interview guide to establish validity and dependability (Patton, 2015). The Walden University IRB and my committee provided valuable feedback throughout the research process. I kept reflective journals and notes throughout the data collection and analysis process to accurately record each stage so that the study could be replicated in the future. I described the data analysis process and other data related to this study.

Confirmability

Confirmability is the qualitative counterpart to objectivity. I used open-ended questions with pre-planned follow-up questions during the interview process, allowing participants to express their experiences, thoughts, and perceptions freely to achieve confirmability. I created an interview guide that included the study's purpose, research question, and conceptual framework. I kept a reflective journal and took notes throughout and after the interview process, allowing me to analyze and synthesize the data. The

participants reviewed their interview transcripts to ensure the data and my analysis were correct.

Summary

I organized a key finding for each research question based on the data analysis. I arrived at key findings based on the three research questions: Firstly, participants stated that adapting their instruction to online learning was complex because some of their students strive for hands-on learning and that the student-specific disability made a difference in how online learning could be conducted for those students. Participants noted that progress monitoring was also complex because it was hard to tell if the parent was prompting them to the correct answer. Secondly, participants stated that they collaborated with other elementary special education teachers in the district to find out how each other conducted online learning and sharing strategies. Participants expressed the need for parents to be trained for online learning to be successful by learning how to log in and what their child will be learning on the platform. Participants noted that the school district had not provided formal training geared toward students with disabilities; however, they suggested professional development to learn best practices for providing online instruction for students with disabilities. Thirdly, participants noted that distractions and assignment completion was a concern because some students had other siblings doing online learning. Participants stated that it was hard to determine which students had online access or a device and if they did, they had to share it. Participants noted that weekly learning packets and online supplemental resources should be available for those students as needed. In Chapter 5, I reviewed the findings in-depth and explained

how they relate to the literature and conceptual framework. The study's limitations, recommendations for further research, implications for social change, and conclusion will also be discussed.

Chapter 5: Discussion, Conclusions, and Recommendations

The purpose of this basic qualitative study was to explore the perceptions of elementary special education teachers in a school district in the southeastern United States of their pedagogical and technological concerns regarding the shift to online learning for students with disabilities. I used a qualitative approach to learn more about people's perspectives, experiences, and how they interpret those experiences (see Ravitch and Carl, 2016). This study was conducted to better understand the concerns and difficulties elementary special education teachers face when delivering online instruction to students with disabilities.

In this chapter, I present an interpretation of the findings and the ways that this study confirms, disconfirms, and extends knowledge in the discipline of educational technology. The limitations of the study and my recommendations for further research are also provided. Through data analysis, I arrived at key findings based on the three research questions: (a) how the elementary special education teachers described adapting their instruction online as complex because of the resources available online and monitoring progress online; (b) that training is needed for teachers and parents for online learning to be successful for students with disabilities; and (c) the challenges the teachers face in relation to student regulation, online access, and the impact online teaching had has on student learning due to the lack of proper guidance.

Interpretation of the Findings

Based on the findings in the literature, in this section I explain how the results of this study confirm, disconfirm, or extend knowledge in the field of educational

technology for each of the three research questions. Rogers's (2003) theory of diffusion and the CBAM were used as the conceptual framework as well as for the analysis and interpretation of the results.

Interpretation of the Findings by Research Question in Relation to the Literature

RQ1

The findings that corresponded with this research question suggested that teachers had some pedagogical concerns about the shift to online learning. The teachers were concerned about resources, progress monitoring, instruction, and compliance.

Resources. The hands-on learning component of some students' specific disabilities made it difficult for them to learn online. This finding is consistent with those of previous researchers, such as Cagiltay et al. (2019) and Trust and Whalen (2021) who found that it is difficult to apply in-person resources to online learning. Moreover, previous researchers found that there is a need for more resources for special education to help with the transition to online learning (Bicen, 2018; Brewer and Movahedazarhouligh, 2019; Khasawneh, 2017, 2021). According to Cagiltay et al. and Trust and Whalen, there is a scarcity of materials designed for students' disabilities for online purposes. It was evident from the data that participants were making the best use of the resources they could find. This result confirms Cagiltay et al.'s findings who pointed out that special education teachers must make certain modifications or take limited parts of the material to meet the needs of students with disabilities.

Progress Monitoring. Participants agreed that progress monitoring was an important part of online learning for students with disabilities and in determining whether

the parents were playing that important role with their children. Bornert-Ringleb et al. (2021) discovered that parents could act as external regulators for their children if online learning becomes excessive and that they can assist by monitoring or reminding their children of the assignment. Participants in the current study felt that parents were prompting their child to the right answer, making it hard to know if the student understood the concept. Previous researchers found that there is a lack of communication among parents and teachers regarding online learning (Azano and Tackett, 2017; Couper-Kenney and Riddell, 2021; Parmigiani et al., 2021). However, it was evident that this requirement was not met to a great extent in the current study.

Instruction. The participants shared that their special education knowledge aided them in some aspects of what they needed to do when conducting instruction through online learning. This referred to the Universal Design for Learning, which teachers can use in various ways to meet the unique needs of students with disabilities online. Basham et al. (2020), Rao et al. (2021), Scott and Temple (2017), and Smith (2020) confirmed that teachers use knowledge they already possessed in their work. Participants in the current study expressed concerns that providing instruction in a short time frame is challenging to accomplish in a virtual setting.

Compliance. Participants expressed concern about implementing IEPs in the online environment to comply with state and federal guidelines. Tindle et al. (2017) discovered in 28 states that there are some guidance policies for special education teachers; however, there was no evidence for IEPs in the online setting, and 84% of states

have no clear policy on IEPs for online learning. The findings in the current study confirmed the existence of a similar situation in the study site.

Current study findings indicated that there ought to be a way to keep tabs on students and learn about their activities in real time, confirming Gross and Opalka's (2020) findings. Rice and Dykman (2018) showed that there is not much data on students with disabilities getting the accommodations and modifications they need in the online environment, which also, was confirmed in the current study.

RQ2

The analysis of the data derived from interview questions related to RQ2 suggested that the teachers had some technological reservations about the transition to online learning. The teachers' main concerns were the use of technology, a lack of training or specialized training, and parent training.

Use of Technology. Participants stated that the only technology they have used is a Chromebook, laptops, and Promethean boards, which confirmed that they did not have the relevant technological equipment. Cagiltay et al. (2019), Khasawneh (2021) and Trust and Whalen (2021) reported that although teachers conducted online learning, the infrastructure was lacking, which aligned with the findings in the current study. According to Khasawneh, human barriers, such as not changing pedagogy due to a lack of teachers with the technological and technical skills required for online learning, exist. This viewpoint was also confirmed by the current study findings.

According to Anderson and Putman (2020), special education teachers with high technological proficiency independently discovered ways to advance their technological

literacy. However, some participants in the current study are still figuring out how to use online learning technology and currently only use it for the bare minimum. According to Bicen et al. (2018), teachers who use technology infrequently typically create presentations using simple computer programs, strengthening the need for advanced technological knowledge, which the participants in the current study pointed out as a requirement to function effectively.

Lack of Training. All participants reported having no or insufficient training for online learning for students with disabilities. The findings in the current study were in agreement with those of Anderson and Putman (2020), Cagiltay et al. (2019), Sabayleh and Alramamneh (2020), and Smith (2020) who stated that special education teachers lack adequate technical training and need professional development to address and improve their abilities to teach students with disabilities online. Cavanaugh and DeWeese (2020) and Gudmundsdottif and Hathaway (2020) stated that understanding the resources and support special education teachers require through online learning helped develop practical professional development strategies. However, the findings in the current study revealed that it was not available to the participants.

Specialized Training. Participants in the current study believed specialized training was required to teach students with disabilities online effectively. By emphasizing individual experiences, educating special education teachers on best practices and enhancing their understanding of how to make online learning more accessible, professional development helps prepare them to work with students with disabilities online were the findings from the studies conducted by (Bornet -Ringleb et

al., 2021; Love Edwoldt,2021; Trust and Whalen, 2020, 2021. This was corroborated by the findings in the current study.

Parent Training. Another finding in the current study was that parent training is required for parents with a child with a disability participating in online learning. Parmigiani et al. (2021) confirmed this need to provide parents with technical and educational support. This idea that parent-teacher collaboration is essential because students with disabilities benefit from online learning and that it has an impact on the services they receive was further strengthened by the work of Akbayrak et al. (2021), Alvarez -Guerro et al., (2021), Ayda et al. (2020), Collier et al. (2017), and Supratiwi et al. (2021), thus confirming the current study findings.

RQ3

The analysis of the data related to RQ3 suggested that the teachers may have experienced some difficulties with the transition to online education. The teachers' main worries were synchronous, self-regulation, guidance, and lack of online access.

Synchronous. Synchronous online teaching was challenging for the participants in the current study. Alshamri (2021) confirmed this challenge, stating that teachers were performing double duty by learning and conducting online learning simultaneously. The current study findings confirm those of previous research regarding teachers who were providing synchronous online teaching, yet student engagement (see Bornert-Ringleb et al., 2021; Kim and Fienup, 2021; Sulaimani, 2017; Yazcayir and Gurgur, 2021).

Self-Regulation. Current study Findings related to self-regulation indicated the teachers' concern about the online self-regulation of a student with disabilities self-

regulation, stressing that that student needed face-to-face interaction and that it affected assignment completion. Kim and Fienup (2021) described a scenario in which a teacher implemented a system that listed assignments for students who struggled to complete them in the online environment. This finding confirms that teacher support will facilitate student success. Hughes et al. (2017) also confirmed this finding by stating that a task analysis brings about successful learning by creating direct expectations and consequences.

Guidance. The current study findings confirm previous research regarding the constant changing and lack of clear answers when it comes to online learning for students with disabilities (see Crouse et al., 2018; Long et al., 2021; Supratiwi et al., 2021). Previous researchers found that there is no clear answer on how online learning should be implemented (Steed and Leech, 2021; Tindle et al., 2017). The current study findings confirm these ideas because the participants expressed concerns about the numerous issues that have occurred with online learning.

Lack of Online Access. Participants expressed concerns about the lack of online access for students with disabilities. These findings were confirmed by those of Catalano et al., (2021) and Trust and Whalen (2021) who stated that some students were sharing devices with other household members. It was evident from the data that learning packets were needed for the online learning of students with disabilities. This finding extends the work of Trust and Whalen who stated that teachers struggled to determine who had internet or a device for online learning.

Interpretation of the Findings in Relation to the Conceptual Framework

Rogers's (1995, 2003) theory of diffusion and the CBAM (Hall et al., 1973) comprised this study's conceptual framework. The framework served as the lens through which I developed the research questions, interview guide, and data analysis process for the study. The study findings are related to both the theory and model.

CBAM

To understand technology adoption from the perspectives of elementary special education teachers, I used the CBAM. Participants were concerned about applying the resources used in-person to online learning at the personal SOC. In terms of management, participants indicated that teaching face-to-face and online simultaneously was a concern. All participants reported receiving little to no online training on teaching students with disabilities. After experimenting with online learning and collaborating with other elementary special education teachers, participants concluded that more specialized training was required. Participants wanted to learn best practices for teaching students with disabilities online that require professional development and specialized training. This supports the findings of Georgiou and Ioannou (2019) that teachers in the refocusing stage require additional professional development.

All participants stated they had only worked with Chromebooks, laptops, and Promethean boards. Orientation, refinement, integration, and renewal were the participants' LOU. In the beginning, participants were in the orientation stage. All participants felt it was a learning curve, but they were eager to learn more about online learning. It was clear that one participant was in the refinement stage. She used Google Meets and discovered students could use manipulatives online to their benefit. All

participants were at the integration level because they were all collaborating to share what worked and figure out what did not. The participants were also in the process of renewal. Participants were working to stay up to date with technology to help them with online learning.

Rogers's Theory of Diffusion

I used Rogers's (2003) theory of diffusion to examine the technology adoption of elementary special education teachers as they transition to online learning. Throughout the interviews, all participants stated they had no specialized training in providing online instruction to students with disabilities. The participants ranged in adopter status from innovators to a late majority (see Rogers, 2003). The participants also exhibited various diffusion characteristics ranging from compatibility to observability. Since there was a learning curve initially, all participants wanted to learn how to better serve students with disabilities online through specialized training. Rogers would have classified them as innovators, early adopters, and members of the late majority.

All participants agreed that their understanding of special education enabled them to transition to online learning successfully. According to some participants, it was mostly trial and error to figure out what worked with their online students. Most participants admitted that they sought support from other elementary special education teachers inside or outside their building. They would have been categorized by Rogers (2003) as between trialability and observability. Participants sought ways to enhance online instruction for students with disabilities.

Limitations of the Study

10 elementary special education teachers took part in this basic qualitative study. One limitation is that the findings of this study, like those of most qualitative studies, cannot be generalized to reflect the perceptions of all elementary special education teachers. Moreover, administrators and other district teachers did not take part. The study site district employs a variety of teachers, support staff, and service providers who may be able to provide more information about the transition to online learning for students with disabilities. Therefore, using a limited number of teachers drawn from the elementary level is another limitation because the findings cannot be applied irrevocably to other broader settings. The data collection method for this study was limited to semi structured interviews. Using only one form of data collection prevents data triangulation to a great extent, resulting in another limitation to the study.

Recommendations

Recommendations for further research are based on the results and limitations of this study. The first recommendation is related to findings about the training that elementary special education receive. It is recommended that elementary special education teachers receive adequate specialized training and resources to teach students with disabilities online. To achieve the desired outcome with technology, school leaders must ensure that teachers have specific tools and training tailored to their role, particularly pedagogy, as stated by Steed and Leech,2021; Sulaimani,2017. Teachers with a solid background in their pedagogy, available technology, knowledge of their student's needs, and proper training make teaching students with disabilities less difficult.

Sulaimani (2017) proposed that teachers receive training as new technology that benefits students with disabilities become available.

A second recommendation is related to the limitation of this study. This study does provide data on elementary special education teachers' perceptions, but only in the context of one school district. As a result, additional research with other elementary special education teachers from different districts could benefit. Because this study was limited to elementary schools, further research at the middle and high school levels is required, including service providers and support staff. More research is needed in online learning for students with disabilities at the elementary level to improve student learning and teacher confidence in providing instruction. Therefore, it is recommended that research pertaining to this specific area should be conducted using a larger sample, perhaps using mixed methods strategies.

Implications

This study will contribute to positive social change in several ways. At the individual level, elementary special education teachers can learn best practices and strategies for providing online instruction to students with disabilities. At the organizational level, this study's results can influence school leaders' perspectives on the resources and needs that elementary special education teachers require to conduct online learning successfully. As a result, at the policy level, policymakers may form a task force to collect data on teachers on platforms or programs that may impact students with disabilities online. The findings of this study could lead to positive social change by contributing to correcting the gap in practice in the training that elementary special

education teachers receive for online instruction for students with disabilities. Therefore, addition or change in training would fill a gap in elementary special education teachers' preparation to conduct online learning for students with disabilities and may lead to better outcomes for those students.

Conclusion

The purpose of this basic qualitative study was to explore the perceptions of elementary special education teachers in a school district in the southeastern United States on their pedagogical and technology concerns regarding the shift to online learning for students with disabilities. The data presented in this study came from semi-structured interviews conducted with 10 elementary special education teachers. The data signaled that the teachers were collaborating with other elementary special education teachers to meet the needs of their students, essentially seeing what was working and what was not. Additionally, teachers reported that some students with disabilities tend to pay more attention and interact more if an adult was present during the online learning sessions. The data suggested that teachers had some concerns about applying in-person resources to online learning and progress monitoring. The data also presented that elementary special education teachers had little formal training in online learning for students with disabilities. The data suggest that school leaders look into the possibilities of adopting specialized training for teaching students with disabilities online to meet their needs by harnessing the power of technology.

It is essential to put procedures in place to ensure that students with disabilities receive the same instruction, services, and interventions online as they would in person.

Therefore, students with disabilities would benefit from elementary special education teachers receiving adequate training to conduct online learning. Elementary special education teachers can provide students with disabilities with the instruction, interventions, and services they need online. To ensure that students in a digital special education program receive the necessary interventions, all formats for online instruction and alternatives to online teaching must be considered, as stated by Medwetz et al. (2021).

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Appendix: Interview Questions

Research Questions	Interview Questions	Follow-Up Questions
RQ1: What pedagogical concerns do elementary special education teachers at a school district in the southeastern United States have related to the shift to online learning for students with disabilities?	How does your teaching knowledge influence how you teach students with disabilities online? What was the most challenging aspect of adapting your instruction for providing instruction to students with disabilities from in-person to online learning?	What instructional changes have you made?
RQ2: What technological concerns do elementary special education teachers at a school district in the southeastern United States have related to the shift to	What impact does your use of technology have on how you deliver online learning to students with disabilities?	Do you have any experience conducting online learning using these technologies? How could elementary special education teachers

online learning for students with disabilities?	What kinds of technology have you worked with before? How much training have you received on conducting online learning for students with disabilities?	be better prepared to teach students with disabilities in terms of online learning?
RQ3: What are the problems and issues faced by the teachers when implementing online learning with students with disabilities?	What are some of the challenges you have encountered while planning and implementing online learning for students with disabilities?	How did you resolve those challenges? Did you seek assistance from other elementary special education teachers?