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Special Education Co-Teachers' Role in the Adoption of Information and Communication Technology Tools in Inclusive Classrooms

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Walden University

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Amy Hysick

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Walden University

2024

Abstract

Special Education Co-Teachers' Role in the Adoption of Information and
Communication Technology Tools in Inclusive Classrooms

by

Amy Hysick

MA, Binghamton University, 1999

BS, Binghamton University, 1997

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Abstract

Co-teaching is a common service delivery model where a general and special education teacher are paired in the same classroom, though little is known about the experiences of secondary special education co-teachers in the adoption and use of information and communication technology (ICT) tools in inclusive, co-taught classrooms. The purpose of this qualitative study was to investigate the experiences of special education co-teachers in the adoption and use of ICT tools. Venkatesh et al.'s unified theory of the acceptance and use of technology was the conceptual framework for the study. The research question focused on the experiences of special education co-teachers in the adoption and use of ICT tools, the role of the co-teaching relationship in instructional decision-making, and the availability of resources and support for ICT tool use. A basic qualitative approach used semistructured interviews with 12 secondary special education co-teachers to gather data and identify codes, categories, and themes based on the conceptual framework and research question. The results of this analysis revealed that special education co-teachers found that ICT tools can be beneficial for students with disabilities and that the development of the co-teaching relationship plays a large role in the special education co-teachers' ability to influence ICT decisions. These findings could lead to positive social change and improved outcomes for students with disabilities when school districts recognize the importance of the co-teaching relationship in the instructional decision-making process, devote resources to strengthening co-teaching relationships, and provide access to training and support for ICT tool use.

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Chapter 1: Introduction to the Study

The Individuals with Disabilities Education Act (IDEA; 2004) stipulates that students with disabilities should be educated in the least restrictive environment possible, increasing the number of co-taught, inclusive classrooms in the United States. Co-teaching is defined as general education and special education teachers working together to deliver instruction in a general education class that contains students with disabilities (Friend et al., 2010). This inclusive setting is intended to remove barriers for students and may increase the academic achievement of students with disabilities (Ansari Ricci et al., 2021; King-Sears et al., 2021; Somma & Bennett, 2020).

Implementing information and computer technology (ICT) solutions in co-taught inclusive classrooms to differentiate instruction could help meet the needs of students with disabilities, further reduce institutional barriers, and improve student outcomes (Kumm et al., 2021; Lam et al., 2021). While research has investigated the use of ICT for differentiation from preschool to higher education settings (Anderson & Putman, 2020; Chiu & Lim, 2020; Lohmann et al., 2019; Pearson et al., 2019), the influence of special education teachers in inclusive classrooms on ICT implementation decisions is a topic that has not been as widely studied. This research may fill a gap in the existing literature by exploring the experiences of special education co-teachers within their co-teaching relationships to discover their role in the instructional decision-making process in their inclusive classrooms regarding the ICT tools that are adopted or rejected. This study focuses on the perspectives of special education co-teachers who work in inclusive

secondary classrooms in public schools, a population that is underrepresented in current research (Anderson & Putman, 2020; Bogen et al., 2019; Courduff & Muktari, 2021).

In this chapter, I outline the problem and purpose for the study, state the research question, discuss the conceptual framework and nature of the study, provide definitions for the terms used throughout the study, discuss the assumptions and limitations of the study, and outline the significance of the study to understanding the experiences of special education co-teachers who use ICT tools in inclusive settings.

Background

Seven recent studies have investigated the benefits and challenges of using ICT tools in various classroom settings. The barriers to implementation could be a lack of access to professional development and training, inadequate planning time to construct or modify lessons, teachers' beliefs about the usefulness of ICT tools (Magen-Nagar & Firstater, 2019), unreliable or malfunctioning technology (Anderson & Putman, 2020), or a lack of strategic planning for ICT implementation by school districts (Sosa-Díaz et al., 2022). In addition, the rapid pace at which new ICT tools are developed and released does not provide adequate time to study their effectiveness with students (Boyle & Kennedy, 2019). Additional research is needed to understand how ICT tools are used in special education settings to provide instructional accommodations in the least restrictive environment (Starks & Reich, 2023). Seven studies have investigated special education teachers' implementation and use of ICT tools in inclusive classrooms, and both Anderson and Putman (2020) Courduff and Muktari (2021) have expressed a need for

research into ICT use by special education co-teachers in inclusive classrooms in public schools.

Problem Statement

Little is known about the experiences of secondary special education co-teachers in adopting and using ICT tools in inclusive classrooms. Co-teaching grew from a practice of team teaching introduced by Trump (1966) and further defined by Friend et al. (2010) as a way to meet the requirements of the IDEA (Individuals with Disabilities Education Act, 2004). Three recent studies have investigated and reported benefits for students with disabilities in the areas of academic achievement (King-Sears et al., 2021), social interactions with peers (Tryfon et al., 2021), and engagement and focus in class (Preston-Smith et al., 2020). However, having a second teacher in the classroom does not guarantee efficacy because the co-teaching models outlined by Friend et al. (2010), which are discussed in more detail in Chapter 2, are not consistently implemented in classrooms (*Andrew F. v. Douglas County School District*, 2017; King-Sears et al., 2021). There is a lack of available professional development on collaboration and co-teaching techniques that could provide co-teachers with the skills needed to form effective co-teaching partnerships (Ansari Ricci et al., 2021; Crispel & Kasperski, 2021; King-Sears et al., 2021; Lindner & Schwab, 2020; Preston-Smith et al., 2020; Tryfon et al., 2021).

One method to improve learning outcomes for students with disabilities in inclusive co-taught settings may be to incorporate ICT tools to differentiate and accommodate classroom materials (Andersen & Sorensen, 2017; Kroesch et al., 2020; Starks & Reich, 2023). However, significant barriers such as a lack of access to ICT

tools, teachers' negative views on the usefulness of ICT tools for instruction, and the lack of training on ICT implementation and use prevent the successful integration of ICT tools into inclusive classrooms (Anderson & Putman, 2020; Basham et al., 2020; Isgett & Wang, 2021; Nicu & Bancila, 2019; Starks & Reich, 2023). Special education teachers are often not included in the decisions about which ICT tools will be adopted and used to make accommodations for the specific learning needs of their students with disabilities, leading to gaps in accessibility (Shaheen & Lohnes Watulak, 2019; Starks & Reich, 2023).

The call for further research into special education co-teachers' use of ICT tools issued by Anderson and Putman (2020) and Courduff and Moktari (2021) suggests that we need to have a better understanding of how special education co-teachers adopt and use ICT tools to accommodate students' learning needs, their contributions to the decision-making process in co-teaching relationships, the support they receive from their districts, and the areas where they feel changes in current practice are needed. This increased understanding could help school districts strategically use the experiences of special education co-teachers to inform the decisions regarding the adoption and implementation of ICT tools to better meet the individual learning needs of students with disabilities.

Purpose of the Study

The purpose of this qualitative study was to investigate the experiences of secondary special education co-teachers in the adoption and use of ICT tools in inclusive classrooms. When framed by the conditions for adoption outlined in the unified theory of

acceptance and use of technology (UTAUT), which is discussed in more detail in the conceptual framework section below, the results of the study may provide a more detailed understanding of how performance expectations, effort expectancy, social influence, and facilitating conditions influence ICT adoption for this unique population and in this unique setting.

Research Question

The research question is designed to explore the experiences of secondary special education co-teachers in adopting ICT tools from the perspective of the four contributing factors to ICT adoption explained in the UTAUT model.

RQ: What are the experiences of secondary special education co-teachers in the adoption and use of ICT tools in inclusive classrooms?

Conceptual Framework

The UTAUT (Venkatesh et al., 2003) provided the framework for the study and investigates the performance expectations, effort expectancy, social influence, and facilitating conditions that contribute to the adoption or rejection of ICT tools from the perspective of secondary special education co-teachers. The UTAUT emerged from Venkatesh et al.'s (2003) synthesis of eight different technology acceptance models, each of which could explain between 17 and 53 percent of users' intentions to adopt a particular technological tool. The unified theory provides a more accurate and complete view of users' intentions to adopt new technology solutions. It can account for 70 percent of users' reasons for acceptance of new ICT tools and the likelihood of successful implementation of a particular solution.

The UTAUT is a model for studying the interaction between the variables that could affect a user's likelihood of adopting ICT tools. The four determinants of performance expectations, effort expectancy, social influence, and facilitating conditions for ICT adoption provided the template for constructing the questions in the interview guide to solicit specific information about co-teachers' experiences and perceptions surrounding the reasons for adopting or rejecting various ICT tools. The current study built on the existing theory by contributing information about the experiences and perspectives of special education co-teachers as they adopt and implement ICT tools in their classrooms. The variables that define this group of individuals and influence their decisions about the ICT tools used in inclusive settings have yet to be widely studied. The model presented in the UTAUT guided the analysis of these possible interactions and their influence on the reasons for ICT adoption from the perspective of special education co-teachers. A more detailed analysis of the UTAUT and its influence on ICT adoption is included in Chapter 2.

Nature of the Study

The research question for this study attempted to provide insight into the experiences of special education co-teachers and their perceptions about their role in the ICT adoption process and incorporate the participants' voices into the findings (Burkholder et al., 2016). Therefore, a qualitative approach using semistructured interviews was appropriate and allowed the participants to freely share their thoughts, perspectives, perceptions, and experiences with the researcher (Rubin & Rubin, 2012). A basic qualitative study allows for patterns to emerge during the data analysis that will

help to understand how the special education co-teachers make meaning of their experiences in inclusive classrooms regarding ICT implementation (Merriam & Tisdell, 2016).

The UTAUT served as the framework for developing the interview guide (see Appendix) and should increase consistency in data collection and dependability of the findings while gathering relevant information to help answer the research questions (Burkholder et al., 2016). The questions and probes developed for the interview guide solicited specific information from the participants about their experiences with the conditions for ICT adoption outlined in the UTAUT. The development of the interview guide is discussed in more detail in the section on Instrumentation in Chapter 3. Using semistructured interviews provided the opportunity to adjust the pacing and flow of the interview and ask probing questions to gather more data and better understand the participants' experiences (Burkholder et al., 2016; Rubin & Rubin, 2012).

The participants for the study were secondary special education co-teachers who work in inclusive classrooms in public schools and use ICT tools as part of their classroom instruction. The ideal sample size was 8-12 participants, although recruitment and interviews continued until the data gathered provided sufficient information to address the research questions and additional interviews did not provide unique insight into their experiences (Cober & Adams, 2020; Guest et al., 2006).

Data were collected using a researcher-developed instrument to conduct semistructured interviews using the Zoom video conferencing platform. Interviews were recorded for transcription purposes. Once the transcripts were created, they were sent

to the participants to verify accuracy before data analysis began. Data analysis used an inductive coding method beginning with identifying In Vivo codes, which were grouped into categories and themes as subsequent interviews were analyzed. The Quirkos qualitative analysis software program was used during the data analysis process. Participants received a copy of the summary of the study's findings after data analysis.

Definitions

Effort expectancy: “the degree of ease associated with the use of the system” (Venkatesh et al., 2003, p. 450).

Facilitating conditions: “the degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system” (Venkatesh et al., 2003, p. 453).

Performance expectancy: “the degree to which an individual believes that using the system will help him or her to attain gains in job performance” (Venkatesh et al., 2003, p. 447).

Social influence: “the degree to which an individual perceives that important others believe he or she should use the new system” (Venkatesh et al., 2003, p. 451).

Venkatesh et al. (2003) identified the direct role that these four conditions play in users' adoption of ICT tools and usage behavior. The UTAUT was used to design the interview questions to directly seek information on the performance expectancy, effort expectancy, social influence, and facilitating conditions that govern the adoption of ICT tools in inclusive classrooms from the perspectives and experiences of secondary special education co-teachers.

Assumptions

Different definitions and interpretations of the terms co-teaching and inclusion exist, which may have affected how school districts structure their inclusive classes or the students who are placed in co-taught settings. One assumption made for this study, consistent with the conditions for co-teaching outlined by Friend et al. (2010), was that the participants were special education co-teachers currently teaching in inclusive classrooms in partnership with a general education co-teacher, and each class contained a number of students with disabilities. The service delivery model for these co-teaching teams matched with one or more of the co-teaching models explained in the Friend et al. (2010) article, which is explained in more detail in Chapter 2.

An additional assumption was that the participants were truthful in their responses, honest about their experiences, and comfortable sharing their perceptions, thoughts, and experiences in their co-taught classrooms. Participants were reminded that no identifying information would be included in the study and that pseudonyms would be used for all participants, their co-teachers, and the school districts in which they work. It is necessary for the purpose of the study that I believe the participants' responses were honest and accurate accounts of their experiences. Qualitative studies that gather data using interviews can be subject to researcher bias during the interview process, data analysis, or the interpretation of findings. An assumption for this study was that using a reflective research journal and responsive interviewing technique could control any introduced researcher bias.

Scope and Delimitations

The purpose of this qualitative study was to investigate the experiences of secondary special education co-teachers in the adoption and use of ICT tools in inclusive classrooms. Although the study was not confined to participants in one geographic area of the country, the scope of the study contained experiences only from secondary special education co-teachers in inclusive classrooms. Special education co-teachers are responsible for making modifications and accommodations to classroom materials to meet the individual learning needs of the students with disabilities in their classrooms, although their input is not often sought in adopting ICT tools for use with their students. I chose the UTAUT as the framework for my study, as it outlines the conditions that influence the adoption of ICT tools. Learning more about the influence that secondary special education co-teachers have on the adoption of ICT tools through the lens of the UTAUT helped gain an understanding of the role that secondary special education co-teachers play in the ICT adoption process and the conditions that influence their decisions about ICT adoption.

While the target population for the study included only secondary special education co-teachers, the findings about their degree of influence over ICT adoption decisions could provide insight into the development of co-teaching relationships and the role that special education co-teachers have in the instructional decision-making process. Additionally, special education teachers have unique insight into the individual needs of their students with disabilities and how ICT tools can be used to meet those needs. However, the voices of special education teachers are not often sought when decisions

are made regarding adopting ICT tools. Exploring the experiences and degree of influence that secondary special education co-teachers have in adopting ICT tools could reveal opportunities for the voices of special education co-teachers to be heard to advocate for specific ICT tools to meet their students' needs. Their insight into how different types of ICT tools can be used to provide accommodations and modifications to the general education curriculum could be used proactively by school districts to select and implement ICT tools to meet a wider range of disabilities and improve learning outcomes for more students.

Limitations

The qualitative nature of the study was a limitation, as the findings cannot be generalized to a larger population. However, the participant pool extends across the United States rather than being confined to one geographic area. The Zoom video conferencing software enabled me to select and interview participants without regard for geographic distance. Still, the lack of in-person interaction may have reduced the amount and quality of observations about body language, tone, and inflection that could reveal insight into the participants' responses. I hoped that by soliciting experiences and perceptions from special education co-teachers from across the country and reviewing the audio recording multiple times, the data might provide a broader picture of the role that special education co-teachers play in adopting and implementing ICT tools in inclusive classrooms.

As a general education teacher who has worked with special education co-teachers in inclusive settings, my experiences may be a source of bias. Responsive

interviewing techniques and a reflective research journal during data collection and analysis helped to minimize the influence of researcher bias.

The definition of co-teaching adopted for this study was based on the description outlined in Friend et al. (2010), where a general and special education teacher work in partnership to deliver instruction to all students in the same classroom and accommodations to instruction for students with disabilities. Not all studies involving co-teaching provide detailed descriptions of the conditions in which co-teaching occurs, the roles each co-teacher plays, the selection or inclusion process for the students assigned to co-teaching environments, or the implementation conditions in co-taught classrooms. The variability of terminology in the literature and the need for more detail in recent studies about the specific conditions in co-teaching environments may impact the interpretation of findings for this study.

Significance

Learning about the ways co-teachers currently use ICT tools in inclusive classrooms through the experiences of special education co-teachers could provide insight into the influence that special education co-teachers in secondary settings have on instructional decisions in co-taught classrooms, including decisions about the ICT tools that are implemented and retained in inclusive classrooms and how those tools are used to improve student outcomes. This insight into the reasons for the adoption or rejection of ICT tools and the implementation process from the perspective of special education co-teachers could reveal patterns in instructional decision-making within the co-teaching relationship and lead to recommendations that could increase the rate of adoption of ICT

tools for differentiation, which could lead to improved academic outcomes for students with disabilities and additional opportunities after leaving high school. This study could also help increase understanding of the ICT adoption process in co-taught classrooms.

Summary

Co-teaching has become a commonly used service delivery method for students with disabilities. Many studies have been conducted on the effectiveness of the co-teaching model, the development of the relationship between co-teachers, and the challenges of implementing co-teaching. Additional studies have been conducted on using technology in inclusive and co-taught classrooms to help meet the instructional needs of students with disabilities. The specific contributions of special education co-teachers regarding the ICT tools adopted in inclusive settings have yet to be fully explored or explained.

In this chapter, I outlined the background of the study, problem statement and purpose, research questions, discussed the nature of the study, included definitions used in the study, and provided a discussion of the study's potential significance. Chapter 2 includes a review of the pertinent literature to outline the current understanding of secondary special education co-teachers' experiences with ICT tools and their roles within inclusive classrooms.

Chapter 2: Literature Review

Little is known about the role of secondary special education teachers in adopting or rejecting ICT tools to differentiate the needs of their students with disabilities. The purpose of this qualitative study was to investigate the experiences of secondary special education co-teachers in the adoption and use of ICT tools in inclusive classrooms. While co-teaching as an instructional delivery method has been well studied, there have been few studies on using ICT tools by special education co-teachers. Anderson and Putman (2020) call for further research on special education teachers' use of ICT in inclusive settings. Courduff and Moktari (2021) echo this encouragement for additional investigation and advocate for researchers to explore the unique experiences of special educators who successfully integrate technology.

In this chapter, I discuss the history of co-teaching and its current use in classrooms, the possible benefits of co-teaching, challenges to co-teaching, the need for co-teacher training, the need for time for collaboration and planning, the roles of general and special education co-teachers, the use of ICT tools in classrooms, benefits of ICT use for general education students, benefits of ICT use for students with disabilities, and the barriers to ICT use in inclusive settings.

Literature Search Strategy

The Walden University library's Thoreau multi-database access was used to conduct a comprehensive search to locate peer-reviewed, published research articles for the dissertation. Articles were accessed via the Education Resources Information Center (ERIC), SAGE Journals, Taylor & Francis Online, ScienceDirect, and Education Source

databases. Google Scholar sent notifications of recently published articles on co-teaching, ICT use and implementation, research related to UTAUT, differentiated instruction, technological pedagogical and content knowledge (TPACK), and educating students with disabilities.

Co-teaching, according to Friend et al. (2010), is a collaborative partnership between general and special education teachers who work together in the same classroom at the same time to provide accommodations for students with disabilities within the general education classroom. However, co-teaching in the literature is also called collaborative, cooperative, or team teaching. It can be found in articles on differentiation of instruction, personalized learning, personalized instruction, mainstreaming, and inclusive education. Articles that use the term co-teaching to pair a new teacher with an experienced teacher in a working relationship resembling an apprenticeship rather than referring to inclusive settings containing students with disabilities were excluded from the literature review. The initial search for articles combining co-teaching, secondary education, inclusive education, and students with disabilities was limited to those published since 2019, and 62 articles of potential interest were returned.

Articles on TPACK, assistive technology, augmented reality, personalized learning, and online learning can also contain information about ICT use. Articles published within the last 3 years were used, as older articles may not reflect the adoption and ICT usage in current classroom environments. An initial search for TPACK returned 1587 articles. After abstract and content review, it was revealed that many of the articles used extremely small sample sizes, reported findings that were inconsistent with other

articles on TPACK, were conducted in countries with educational conditions that are different from those in the U.S., used overwhelmingly single-gendered participant groups, excluded entire age ranges of teachers, and did not adhere to rigorous academic research standards. Considering the article review results, none of the TPACK articles were included in this literature review.

Articles using UTAUT as the theoretical framework were located by searching for combinations of UTAUT or unified theory of acceptance of technology and secondary education, co-teaching, and students with disabilities, and the initial search returned 141 articles. An abstract review revealed that many articles used sample populations in higher education, medical fields, or mobile technology and were excluded from the literature review. Relevant articles were limited to articles published from 2019 to the present. This provided a more accurate picture of how the factors identified in the UTAUT for adopting ICT tools play out in current educational environments.

Conceptual Framework

The UTAUT provided the framework for the study and outlined the conditions of performance expectancy, effort expectancy, social influence, and facilitating conditions that act as determinants in the decision to implement ICT tools (Venkatesh et al., 2003). This study investigated the experiences of secondary special education co-teachers through the lens of the UTAUT to determine how the conditions identified in the UTAUT play out in secondary co-taught classrooms in the United States.

Prior to the UTAUT, several different models had been published that explained users' intentions to adopt and use new ICT tools. Venkatesh et al. (2003) evaluated eight

of those models to determine the extent to which that model correctly accounted for users' acceptance of new ICT tools, used those results to construct a new integrated model that contained elements from the eight existing models and measured the extent to which the new model could account for the variance in users' intentions to adopt ICT tools. The models tested were the theory of reasoned action, the technology acceptance model, the motivational model, the theory of planned behavior, a combination of the technology acceptance model and the theory of planned behavior, the model of personal computing utilization, innovation diffusion theory, and social cognitive theory. Each of the theories and their limitations is discussed below.

The theory of reasoned action has been used to predict various people's behaviors but was not specific to the use and adoption of ICT tools and did not include any measure of the users' voluntary choice of adoption (Fishbein & Ajzen, 2009). The technology acceptance model (TAM) investigated users' perceptions of the usefulness of ICT tools and their ease of use (Davis, 1989). The TAM did not include gender, experience, or voluntariness as factors that could contribute to user acceptance. The motivational model looked into users' intrinsic and extrinsic motivations in using ICT tools in the workplace and whether users adopted them more because the tools were useful or enjoyable but did not include any discussion of the modifying effects of experience, voluntariness, gender or age (Davis et al., 1992). The theory of planned behavior is modified from the theory of reasoned action to include an individual's perception of control over their behaviors as an additional indicator to determine the variance in acceptance rates but did not include experience or voluntariness in their analysis (Ajzen, 1991). Taylor and Todd (1995)

combined the theory of planned behavior and the technology acceptance model and tested it to see if the addition of experience and perceived control over one's behavior could account for more of the variance between users than either model alone; however, they did not address voluntariness, gender, or age of the participants. Thompson and Higgins (1991) adapted the theory of reasoned action to include social norms, habits, perceived consequences, facilitating conditions, and attitudes toward ICT use and created the model of personal computing (PC) utilization, but their combined theory didn't measure the effects of voluntariness, gender, or age. The innovation diffusion theory investigates the way that innovations spread through members of a system and found that the relative advantage, ease of use, demonstration of results, visibility, and ability to conduct trials were significant predictors of ICT adoption; however, neither gender nor age were included in the analysis (Rogers, 2003). Social cognitive theory by Bandura (1986) explored the interaction between cognitive, behavioral, and environmental factors on human motivation and the influence of a social network in the spread of innovation through a population. While this theory provides a comprehensive look at the underlying reasons for human decisions and behavior, Bandura did not investigate the role of experience, voluntariness, gender, or age in accepting innovations or ICT tools.

Venkatesh et al. (2003) were able to show that each separate theory discussed above could account for 17 to 53 percent of the variance in individuals' intent to adopt ICT tools but that the combined UTAUT could account for 69 percent of the variance between users and was a more comprehensive and accurate way to predict users' intent. The UTAUT identifies performance expectancy, effort expectancy, social influence, and

facilitating conditions as direct determinants of ICT adoption. The current study sought the perspectives of secondary special education co-teachers on how each of those conditions influences their role in the ICT adoption process.

The central research question in my study sought information about secondary special education co-teachers' experiences using and adopting ICT tools in their inclusive classrooms. The questions on the interview guide directly address the conditions outlined in the UTAUT. The first two sections of the interview guide sought information about teachers' perceptions of performance and effort expectancy by asking about their experiences in adopting and using ICT tools in inclusive classrooms. The third section sought data about the facilitating conditions, such as resources and support in their school building or school district, to determine how those conditions play a role in the adoption process. The final section proposed questions about the co-teaching relationship, how co-teachers negotiate the adoption and use of ICT tools, and the co-planning process, including information about social influence in the adoption process. The interview guide, a researcher-developed instrument (Appendix), contains questions aligned to each of the four conditions outlined in the UTAUT and sought to gather data from participants about the role that each of those conditions plays in their experiences with ICT adoption and use.

Literature Related to Key Concepts

The topics explored in this chapter are a definition of co-teaching and how co-teaching is implemented in schools, possible benefits of and challenges to co-teaching, the need for co-teacher training, the need for time for collaboration and planning, the

roles of general and special education co-teachers in inclusive settings, the use of ICT tools in classrooms, barriers to ICT tool implementation in inclusive settings. This study investigated the adoption of ICT tools in secondary inclusive classrooms from the perspectives of special education co-teachers by examining their experiences with ICT tools.

Co-teaching

The definition of co-teaching for this study is an instructional delivery method where general and special education teachers work together to provide instruction and accommodations for students with disabilities in the general education classroom (Ansari Ricci et al., 2021; Friend et al., 2010). Six different service delivery models that are consistent with this definition of co-teaching have been identified by Friend et al. (2010) and are described in more detail in the following section. However, a literature search for articles on co-teaching reveals that the term co-teaching is used to describe teaching environments outside of this definition. Articles that do not conform to this working definition of co-teaching are excluded from this literature review.

Co-teaching helps satisfy the IDEA (2004) conditions, which require that students with disabilities receive education in the least restrictive environment possible. A student's individualized education program (IEP) specifies the program requirements that meet the child's needs in the least restrictive environment possible; increasingly, those environments are co-taught, inclusive classrooms. Since 2010, the number of students with disabilities ages 6-21 receiving services under Part B of IDEA has increased from 8.4% to 9.7% of students, with 95.1% educated in regular classrooms for at least part of

the school day (Rhodes, 2021). The percentage of students who spent 80% or more of their days in regular classes increased from 60.5% in 2010 to 64.8% in 2019 (Rhodes, 2021). Three recent studies provide moderate evidence that the inclusion of students with disabilities in the general education classroom can improve academic achievement (Ansari Ricci et al., 2021; King-Sears et al., 2021; Somma & Bennett, 2020) and may be a contributing factor in the increase in graduation rates for students with disabilities from 62.6% in 2009-10 to 72.6% in 2018-19 (Rhodes, 2021). This chapter discusses the strength of the evidence for that claim.

History of Co-teaching

Co-teaching grew out of the practice of team teaching proposed by Trump (1966), where a small group of teachers would share instructional responsibilities for the same group of students and individualize instruction in small group learning sessions. The practice became widespread by the 1970s at both the elementary and secondary levels, although there was little evidence of its effectiveness or the consistency with which it was implemented (Friend & Reising, 1993). The initial goal of co-teaching was to allow teachers to work within their areas of expertise to maximize classroom management and instruction.

The passing of Public Law 94-142 in 1975 established the Education for All Handicapped Children Act, which guaranteed a free and appropriate public education to all students with disabilities (U.S. Department of Education, 2024). Although co-teaching was never specified as a required delivery method to fulfill the act's requirements, many districts realized that accommodations could be made within the general education

classroom to meet the individual learning needs of students with disabilities if both general and special education co-teachers worked in tandem to provide instruction for all students (Friend, 2015). Friend et al. (2010) provide a description of the most common co-teaching models used in inclusive settings, outlined in Table 1 below.

Table 1

Description of Common Co-teaching Models

One teach, one observe	one teacher assumes primary responsibility for instruction and the other gathers information about students' behavioral or academic performance
Station Teaching	students rotate through three separate stations: two small group instruction stations led by each of the two teachers and an independent work station
Parallel Teaching	differentiation occurs as teachers present the same material simultaneously to two groups of students
Alternative Teaching	most students work with one teacher and a smaller group is provided with accommodations and reinforcement or enrichment
Teaming	both teachers co-deliver instruction to the entire class
One teach, one assist	one teacher is the primary instrument of instructional delivery and the other provides targeted, individual assistance as they circulate throughout the classroom

Note. Adapted from “Co-teaching: An illustration of the complexity of collaboration in special education,” by Friend, Cook, Hurley-Chamberlain, and Shamberger, 2010, *Journal of Educational and Psychological Consultation*, 20(1), p. 9–27.

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Co-teaching is a service delivery method where a general education teacher and special education teacher are paired in the same classroom and share the responsibilities of instruction and accommodation for students with disabilities (Friend et al., 2010). Friend et al. (2010) explain that the shared responsibility and partnership allow each teacher to work within their areas of expertise to meet the diverse learners' needs in inclusive classrooms. Co-teaching intends to satisfy the legal expectations outlined in the IDEA to include students with disabilities in the general education classroom as the least restrictive environment, while also providing the accommodations and support needed to

access the general education curriculum at the same time as their neurotypical peers.

Depending on the needs of the students in the classroom and the content-area expertise of the special education co-teacher, teachers could deliver instruction in one of the six models described in Friend et al. (2010), as described in Table 1. Co-teachers may switch between these models regularly, as the lesson or the needs of individual students warrant, or may adopt and use one model for most of their instructional time. The most used model is “one teach, one assist,” where the general education teacher can act as the subject matter expert, and the special education teacher can focus on meeting the needs specified in students’ IEPs and providing accommodations for students with disabilities to access the curriculum.

Possible Benefits of Co-teaching

Several recent studies have reported that educating students with disabilities in the general education classroom with their neurotypical peers can provide educational and social benefits, although there is little consistency with the implementation of inclusion or the degree of positive outcomes for students, as reported by King-Sears et al. (2021). The authors performed a meta-analysis on 26 recent studies to compare the academic outcomes for students with disabilities in co-taught and special education classrooms to measure the effect of co-teaching on academic achievement. They sought original studies with comparison groups that reported objective and disaggregated data for academic achievement for students with disabilities that included calculations of effect size. The authors note that all studies included in their analysis defined co-teaching as the pairing of a general and special education teacher in the same classroom setting, although few

studies provided details about how co-teaching was structured or implemented. The authors report a combined medium positive effect on academic outcomes for students with disabilities in co-taught settings ($g = 0.47$) with more benefit for middle school ($g = 0.56$) and high school students ($g = 0.52$) than elementary students ($g = 0.25$). Their analysis revealed that co-teaching had medium positive effect sizes for literacy ($g = 0.60$) and math courses ($g = 0.42$), weak effects for science and social studies courses ($g = 0.08$), and little difference in academic achievement for differences in school location ($p = 0.059$). This seems to suggest that co-teaching can be beneficial for some students, but that the degree of benefit can vary with the specific conditions under which co-teaching is implemented.

A study conducted in Greece by Tryfon et al. (2021) attempted to identify the benefits of co-teaching and inclusion by investigating the perspectives of parents whose children have intellectual disabilities. The authors administered a voluntary survey to 108 parents and the 83 respondents reported their beliefs that inclusive settings provide their children with increased access to academic content and improved opportunities for socialization with peers, although they also shared their concerns that inclusive settings do not ensure that students with disabilities will be entirely accepted by their peers or fully participate in all classroom activities. The parents further shared their beliefs that inclusive classrooms may meet the needs of students with mild to moderate disabilities better than those with more severe disabilities. Missing from this report were the perspectives of parents of neurotypical children placed in inclusive classes, the definition of co-teaching used for the study, and a discussion of effect size. Gathering perspectives

from the parents of students with disabilities about the benefits of inclusion for their children is a valuable viewpoint, and the study's findings agree with King-Sears et al. (2021) that co-teaching can provide benefit for students. However, the lack of detail about the data analysis or the effect size of the findings reduce the usefulness of the results to speculation and anecdotal evidence about the benefits of inclusion and co-teaching.

To examine the possible benefits of co-teaching from an unexplored angle, Preston-Smith et al. (2020) sought students' perspectives by conducting a mixed methods study using disproportionate stratified random sampling to gather data from 99 high school students in 17 co-taught science classrooms about the roles of co-teachers in their inclusive classroom, the benefits of co-teaching, and the areas where inclusive classrooms need improvement. The disproportionate sampling used for the study provided equal representation of respondents with and without disabilities, since students with disabilities make up less than 50% of the population of each class. The vast majority of participants (93.9% of respondents) shared their beliefs that co-teaching is beneficial because the additional teacher provided more assistance and reduced the wait time for assistance, although students remarked that the special educator had a lower level of content knowledge than the general education teacher. According to the student respondents, having two teachers provides the opportunity for reinforcement from a different perspective, fewer behavior problems in class, and increased engagement, focus, and attention. Concerns about the co-taught environment shared by students were that general education co-teachers have more content knowledge, play a larger role in content

delivery, and do more of the talking in class. The authors claim statistical significance of the results based on p values <0.05 but do not include effect sizes for their findings, so while the students' responses may be significant, it is not possible to determine the effect of those responses. While the goal of inclusion is to provide the necessary accommodations for students with disabilities to learn alongside their peers, the lack of consistency in implementation and the lack of detail in current research does not provide strong evidence that inclusion has a positive effect on academic or social outcomes for students with disabilities.

Challenges to Co-teaching

While co-teaching is designed to allow students with disabilities the ability to progress in their learning and make measurable gains in their academic progress, there has been debate about the effectiveness of co-teaching as a delivery service model, suggesting instead that the needs of the student should outweigh the strict adherence to timelines and documentation. In 2017, the Supreme Court ruled that academic accommodations for students with disabilities must allow those students to make a measure of progress appropriate for each child's circumstances (*Endrew F. v. Douglas County School District*, 2017). While school districts using co-teaching as a service delivery method argue that the addition of the special education co-teacher in the general education classroom to make individual accommodations satisfies this requirement and provides the support needed for students to reach their academic and IEP goals, meeting the minimum standard prescribed by the IDEA (2004) does not ensure efficacy. Researchers caution that simply adding a special education co-teacher in the classroom

does not guarantee that students with disabilities in inclusive classrooms will reach the grade-level standard of proficiency on the same schedule as their neurotypical peers, as some students may require higher levels of support than can be provided in the general education classroom (King-Sears, 2022; Weiss & Rodgers, 2020). In a meta-analysis of co-teaching's effect on student achievement for students in secondary school settings in the United States and Belgium, King-Sears et al. (2021) found only medium positive effect sizes for language arts and math courses and weak effects for science and social studies courses, although demographic information was missing for both students and teachers in the analyzed studies. King-Sears et al. (2021) ultimately concluded that this lack of detail in the published research about the implementation conditions for co-teaching did not allow them to accurately measure the quality of the instruction provided in co-taught settings. Without detailed descriptions of the conditions within co-taught classrooms, valid comparisons of the implementation or effectiveness of co-teaching strategies are impossible.

King-Sears (King-Sears, 2022) conducted a study analyzing survey data from 68 secondary special education co-teachers on the use of specialized reading instruction to investigate the effectiveness of co-teaching practices. The Likert-type responses to eight questions on specialized reading instruction were taken from a larger survey for co-teachers. The Likert-type scale had four responses from "strongly agree" to "strongly disagree" and the author reported an acceptable Cronbach's reliability score for the survey at .841, though they combine the ratings for agree and disagree and only report the percentage of respondents who chose the combined agree or disagree category. King-

Sears reports that most special education co-teachers (85.3%) agreed that students' IEPs were used during co-planning for instruction, though 50% of teachers expressed concern that the specialized reading instruction students need is not being delivered in co-taught classrooms and 30.9% believed that students did not receive any specialized reading instruction during the school day. A slight majority (52.9%) were concerned that the reading interventions provided for students minimizes their need to read and therefore is detrimental to building students' reading skills, but 64.7% reported that they build students' accommodations or modifications into daily lesson plans. A majority (58.8%) agree that planning for specialized reading instruction is difficult with students in co-taught classes all day, though a majority (52.9%) disagree that students only receive specialized reading instruction in one classroom and 55.9% disagree that students in co-taught classes have difficulty making progress in their reading. Of interest is the data concerning how the respondents acquired their teaching position: 13.2% volunteered to co-teach after being approached by an administrator, 38.2% were hired specifically to co-teach, 10.3% independently volunteered to co-teach, and 36.8% were informed that they were being assigned to a co-taught role. The lack of effect sizes and discussion of any sort of statistical significance reduces the usefulness of these results to anecdotal and suggestive evidence about the implementation of co-teaching practices, though they contribute to the understanding of the conditions of co-teachers and their experiences in inclusive classrooms. While my study is designed to investigate the experiences of secondary special education co-teachers across all content areas rather than just reading intervention, it is valuable to examine and compare the perspectives of co-teachers in the

delivery of accommodations and modifications within inclusive classrooms, as this population has not been widely studied.

The Need for Co-Teacher Training

One way to increase the quality and fidelity of effective inclusive practices is to ensure that training is provided to the general and special education co-teachers on strategies to adapt instruction for specialized learning needs. Training for teachers in specially designed instruction (SDI) and strategies to accommodate students' individual learning needs could increase the effectiveness of co-teaching as a service delivery model, but a theme repeated in the research is that many teachers still need to receive training in SDI, co-teaching, or accommodation strategies for students with disabilities, and many lack shared collaborative time for both general and special education teachers in co-teaching relationships. Alnasser (2021) conducted a mixed case study on four elementary co-teaching pairs over a three-month period to explore teachers' experiences in their inclusive classrooms. Analysis of the interviews revealed an unequal division of instructional responsibilities within the co-teaching teams, as general education co-teachers were perceived to be the content experts and special education co-teachers as experts in accommodations for students with disabilities. The one teach-one assist model was most used in these classrooms, with co-teachers citing a lack of shared planning time and a lack of training opportunities as reasons for the reliance on that model. This study was conducted at a single elementary school in Colorado, so the results are not representative of a larger population, although the adoption of the one teach-one assist model due to lack of planning time is echoed in a study by Ansari Ricci et al. (2021), the

mixed-method study by Preston-Smith et al. (2020), the meta-analysis by King-Sears et al. (2021) and the qualitative study by Tryfon et al. (2021). Bogen et al. (2019) found a moderately strong correlation between teachers who were offered training in differentiation and their comfort level using differentiation techniques, and the authors argued that offering training will increase teachers' use of differentiation strategies in classroom settings. Crispel and Kasperski (2021) provide suggestive qualitative evidence that teachers desire more training in adapting instruction for students with disabilities. They interviewed ten general education teachers in Israel who participated in professional development designed to improve their skills at adapting instruction for students with disabilities and the teachers reported that the training they received provided differentiation strategies, increased their empathy for students with disabilities, and the participants uniformly agreed that offering more widespread training for both special and general education teachers would be beneficial. In a literature review containing 17 studies on differentiation from four continents, Lindner and Schwab (2020) reported the lack of resources and training for personnel as major challenges for teachers in inclusive settings. Only four of the articles they analyzed were quantitative, so the authors do not include effect sizes to measure the impact of differentiation, but the results throughout the 11 qualitative and two mixed-methods studies consistently reported the lack of resources and training. The repeated message about the lack of training in these studies suggest that providing additional training for both general and special education teachers on differentiation and accommodation in inclusive settings may be beneficial.

A multiple case study design conducted by Weiss et al. (Weiss et al., 2022) with three co-teaching teams at a rural high school in the United States highlighted the need for clarity about the elements of co-teaching and training on co-teaching techniques to increase the accessibility of content for students with disabilities. The participants had between one and 17 years of teaching experience and the only co-teaching training the participants had received was provided by their school district. The researchers performed classroom observations, took and analyzed field notes, and interviewed the participants to look for incidence and evidence of co-teaching practices in their inclusive settings both before and after instruction on the elements of co-teaching. The authors identified the three elements of co-taught classrooms: quality general education instruction, strategies to make content accessible, and specially-designed instruction for students with disabilities. At the conclusion of the study, all three co-teaching teams expressed a better understanding of their roles within the co-teaching environment, a greater level of comfort with the teaching strategies needed to make accommodations for students with disabilities, and used the co-teaching strategies more frequently. While the small sample size and qualitative nature of the study means that the results are not generalizable to a larger population, the study's results are consistent with current literature that expresses the lack of training for co-teachers. In addition, the participants, setting, and structure of the co-teaching environments for this study closely parallels the participants and setting for my study and can inform the interpretation of my results.

While this additional training in differentiation and instructional strategies is needed, there is also suggestive qualitative evidence that the lack of training for special

and general education teachers affects their collaboration and can negatively affect their ability to work as a team in inclusive settings. In a qualitative mixed case study conducted with elementary co-teachers, Alnasser (2021) reported that six of the eight teachers interviewed for the study expressed a need for further professional development and training on differentiation strategies, co-teaching models, and strategies for effective planning. As a qualitative study, Alnasser's (2021) findings are not generalizable to a larger population, although the need for training expressed by the study's participants is echoed in recommendations for co-teaching provided by Cook et al. (2021) and the framework for co-teaching outlined by Weiss and Rodgers (2020). The meta-analysis by King-Sears et al. (2021) notes that many recent studies fail to report whether co-teachers receive training or professional development on co-teaching and few studies explore the longevity of the co-teaching relationship with the same co-teacher.

In a review of current literature, Weiss and Rodgers (2020) use the findings from 49 recent research articles on co-teaching to describe the need for and explain a new conceptual framework for co-teaching practices. However, the authors do not disclose their inclusion criteria, analysis methods, or the strength of the evidence found in the articles they included. They used their analysis of the articles they selected to describe current co-teaching practices and determined that while the addition of special education co-teachers can increase the number of accommodations that teachers can make to the required curriculum, the addition of another teacher in the classroom requires collaboration skills that may be unfamiliar for general education co-teachers due to a lack of training in co-teaching practices. In a similar manner, Cook et al. (2021) use a review

of current articles to report that special education co-teachers are frequently relegated to the role of an assistant within the one-teach, one-assist service deliver model rather than an equal partner in instructional duties. They call for professional development and coaching to better meet the needs of students with disabilities by expanding the role of the special education co-teacher beyond that of an assistant. The authors cite 32 articles in current literature and use their analysis to make recommendations for coaching co-teachers to take a more active role in the classroom, although the authors neglect to include their search or inclusion criteria for their literature review and do not provide details about their analysis. Although the lack of training for co-teachers has been identified in other studies as a challenge to co-teaching, the lack of inclusion criteria for the articles chosen for either analysis, lack of details about the analysis methods, and lack of effect sizes for any of the included studies relegate the recommendations for both of these articles to the realm of the authors' opinions about best practices rather than recommendations based on empirical research.

In addition to training, co-teachers must negotiate and define their roles in the co-teaching relationship to establish shared responsibility for instructional duties in inclusive classrooms. The students' perceptions of the roles of the general and special education co-teachers shared by Preston-Smith et al. (2020) described an unequal division of labor within the co-taught classroom with the special education co-teacher often taking the role of an assistant. A case study of the perceptions of four co-teaching teams consisting of one general and one special education co-teacher in Germany by Lindacher (2020) emphasized the role of communication and collaboration between general and special

education co-teachers to allow those co-teaching teams to adjust their instructional responsibilities to meet the needs of their individual students. Their study had a very small sample size, and therefore the results cannot be generalized, although their findings are consistent with other studies that suggest that communication between co-teachers may be critical for developing effective inclusive classrooms. The importance of explicitly negotiating co-teachers' roles in the classroom is also stated in Cook et al.'s (2021) recommendations for improving co-teaching effectiveness. The negotiation of roles and delineation of responsibilities require communication between the general and special education teachers, which can only be accomplished if the co-teachers have time for collaboration, differentiation, and planning.

The Need for Time for Collaboration and Planning

The adjustments to classroom practice, accommodations to instruction, collaboration, negotiation, and planning that must occur in co-taught settings require time for the general and special education co-teacher to meet and co-plan. Weiss and Rodgers (2020) make recommendations for co-teaching that are developed from their review of current literature and list co-planning time as an essential component of successful inclusive classrooms. The lack of time for planning and collaboration are listed as challenges to co-teaching implementation echoed in Ansari-Ricci et al. (2021). A mixed case study conducted on four different elementary co-teaching pairs in Colorado by Alnasser (2021) revealed that teachers' schedules, which were determined by school district leaders rather than teachers, did not incorporate common planning time for general and special education co-teachers and teachers indicated that this lack of time did

not allow them to implement differentiated instruction strategies fully. Neither study included an analysis of effect sizes or a discussion of the strength of evidence, although their findings are consistent with current research. Both studies stated that providing dedicated time for co-teachers to collaborate might help co-teachers choose the instructional and differentiation strategies that could help students with disabilities in general education settings, which is echoed in the meta-analysis by King-Sears et al. (2021), the mixed-method study by Ansari Ricci et al. (2021), the mixed method study by Preston-Smith et al. (2020), and the qualitative study by Tryfon et al. (2021). Providing this dedicated time for collaboration and planning may help special education co-teachers negotiate a larger or more active role in instructional responsibilities.

As a result of the lack of training or time for collaboration, the one teach-one assist model outlined in Friend et al. (2010) and explained in Table 1 above is commonly used in many co-taught classrooms, with many special education co-teachers reporting that they feel unprepared to assume an active role in content delivery and instead prefer to support student learning while the general education co-teacher provides much of the academic content (King-Sears & Jenkins, 2020; Weiss & Glaser, 2021). This model requires less shared co-planning time to implement and can compensate for the lack of content-specific expertise on the part of special education co-teachers, some of whom are assigned to inclusive settings to work with general education co-teachers without any training or clear communication of the role that each teacher is supposed to play in the classroom, further limiting the influence that the special education co-teacher may have on instructional decisions (Alnasser, 2021; Starks & Reich, 2023). The unequal division

of labor between general and special education co-teachers may contribute to special education teachers' perceptions that they have less authority and autonomy to make instructional decisions in their inclusive classrooms.

A qualitative study conducted with 17 general education teachers and 16 special education teachers in secondary co-taught classrooms in Germany sought teachers' perspectives on the conditions necessary for successful collaboration (Jurkowski et al., 2023). Their analysis defined categories at the level of the larger educational system, the school, and the co-teaching pair. The authors report that the participants expressed mixed feelings about the benefit of inclusion, though the participants all agreed that there is a lack of training for co-teaching in preservice education which may contribute to some misconceptions about the purpose or goals of inclusion. On the school level, teachers cited the need for shared co-planning time to promote collaboration, which is a request echoed in several other studies (Alnasser, 2021; Ansari Ricci et al., 2021; King-Sears et al., 2021; Preston-Smith et al., 2020; Tryfon et al., 2021). From a dyad standpoint, participants prioritized flexibility in communication, intentional definition of co-teaching roles, agreement about the goals of inclusive classes, adjusting the forms of collaboration between co-teachers to meet the needs of the students or the class, and recognizing the benefits to students and teachers as the conditions that contribute to successful co-teaching. While qualitative nature of the study prevents the findings from being generalizable to a larger population, the authors' findings corroborate those from other studies on co-teaching relationships and the importance of dedicated time for co-planning. This study's discussion of the co-teachers' negotiation of roles and approach to

co-teaching informs my study and the interpretation of my findings, as these conditions fall within the category of social influence under the UTAUT (Venkatesh et al., 2003).

Special education teachers' perceived lack of autonomy may play a role in the degree of influence that special education teachers believe they have in the decision-making process and could be a contributing factor in them offering suggestions to adopt or reject specific ICT tools for differentiation. Olsen and Mason (2023) analyzed the results from the National Teacher and Principal Survey (NPTS) conducted by the National Center for Education Statistics to measure general and special education teachers' perceived autonomy and job satisfaction. The survey results included responses from 22,850 teachers, with 12% of those respondents identifying themselves as special education teachers. The authors reported a statistically significant difference ($p < .001$, $CI = [0.11, 0.15]$) in the levels of autonomy that general and special education teachers perceive about classroom decisions regarding instructional materials, methods, content, and evaluating student learning. Their results suggest that special education co-teachers perceive less classroom autonomy in inclusive settings than general education teachers, although the effect of these findings cannot be determined, as the authors did not include a measure of effect size in their analysis.

The special education co-teachers' perceived lack of autonomy and lack of influence could lead to a disconnect between what teachers know they should do as best practices and the actual instructional decisions made in classrooms. Ghedin and Aquario (2020) conducted a mixed-methods study to investigate attitudes and cultures about collaboration and the impact of teacher training on collaboration between co-teachers in

Italy. They surveyed 539 general education and 152 special education teachers using the Co-teaching Rating Scale (CtRS) developed by Gately and Gately (2001) to compare each group of teachers' responses for ideal co-teaching conditions versus real co-teaching conditions and discovered a contradiction between what teachers recognize is needed in inclusive practices and what actually happens in classroom practice. The internal reliability of the scale was within the acceptable range for both the ideal ($\alpha = .90$) and real ($\alpha = .92$) subscales. When comparing the scores on the Likert-type items for general education teachers and special education teachers, significant differences between real and ideal conditions ($p < 0.05$) were found in the areas of interpersonal communication, curriculum goals and modifications and for ideal classroom management, showing that while the teachers surveyed understand the importance of shared planning for differentiation and shared instructional duties in inclusive classrooms, those activities are not occurring regularly. The CtRS was developed by Gately and Gately (2001) an informal rating scale for teachers and administrators to assess the level of collaboration and effectiveness of co-teaching practices in classrooms by identifying discrepancies in the approaches that general and special education co-teachers take to instructional practice in inclusive classrooms. Since its publication, it has been repeatedly used in research studies to identify areas where communication and collaboration between co-teaching partners could improve co-teaching practices.

If special education co-teachers believe that they have less autonomy over the decisions in the classroom and their role in the co-teaching relationship, their reduced role in inclusive settings could impact their performance evaluations. Evaluation of co-

teachers' effectiveness in inclusive settings can be problematic, as evaluative classroom observations and post-conferences typically focus on only the general or special education co-teacher rather than the collaborative team as a unit (McCaw, 2020). The study conducted qualitative interviews with a small sample size of only eight administrators, and although the results cannot be generalized to a larger population, the authors findings suggest a need for collaborative co-planning time for co-teachers, periodic evaluation of the effectiveness of co-teaching partnerships, and training offered to co-teachers and the administrators who evaluate them. The administrators interviewed for the study expressed a wide range of definitions of co-teaching and offered differing opinions about the effectiveness of co-teaching. This lack of consistency from administrator to administrator would prevent them from accurately evaluating the co-teaching relationship during classroom observations. The inconsistency in their responses demonstrates the need for training to ensure inter-rater reliability for administrators who evaluate co-teachers' classroom practices to prevent inaccurate assessments of the effectiveness of the co-teaching relationships and the roles that the general and special educators play in inclusive classrooms.

Roles of General and Special Education Co-teachers

The co-teaching model of equally shared responsibilities that developed from the idea of team teaching presented by Trump (1966) was called into question by Friend et al. (2010), who revealed inconsistencies in co-teaching implementation, the training offered to co-teachers, and the roles that the general and special education co-teachers play in the classroom. To further hinder the analysis of the roles assumed by general and special

education co-teachers, a meta-analysis of research on the effectiveness of co-teaching performed by King-Sears et al. (2021) and another by Losinski et al. (2019) both revealed a lack of details on how co-teaching teams operate within the classroom beyond the pairing of a general and special education teacher in the same classroom. This lack of transparency in the specific duties and roles of each teacher within the co-taught setting does not allow researchers to adequately measure or study the effectiveness of co-teaching as a service delivery model from one school district to another or determine if the roles of the general and special education co-teachers are approaching equally shared duties.

Gilmour et al. (Gilmour et al., 2022) performed descriptive and regression analyses on data gathered from the Schools and Staffing Survey and the National Teacher Principal Survey in conjunction with the Teacher Follow-Up Survey to examine the rate of attrition for special education teachers and determine which aspects of their responsibilities, roles, training, or support played a role in their choice to leave teaching or switch schools. Data from more than 30,000 teachers were analyzed and, after accounting for the teachers' responsibilities, roles, training, and level of support and controlling for teacher and school characteristics, the authors report little statistical significance in the reasons for special education teachers' attrition rates. They did report statistical significance for the correlations that teachers' perceptions that their schools were supportive made them less likely to leave teaching ($p = .001$) and that uncertified special education teachers were more likely to leave teaching ($p = .003$), but the effect sizes were not reported. The authors report correlations that teachers were less likely to

leave when administrative support was available and that teachers were less likely to switch schools in areas with high teacher cooperation, though no numeric values are given for either of these claims. The lack of effect sizes and lack of statistically significant results could indicate that the reasons for special education teachers switching schools or leaving the teaching profession are more complex than can be assessed by a survey instrument and that more research is needed to understand the reasons for the attrition of special education teachers. Interestingly, the authors note that though special education policies have changed over time, there has been relatively little change in the roles, responsibilities, support, and preparation for special education teachers reported on the survey. The authors were unable to report accurate results for co-teaching, as the survey instrument used the term ‘team teaching’ to describe a classroom where more than one teacher is responsible for instruction but did not specify the nature of the co-teachers or their roles within that shared classroom. This lack of consistency with the terminology used in research on co-teaching further hinders efforts to determine the effectiveness of co-teaching strategies or their impact on student outcomes.

Despite the ideal co-teaching relationship where teaching responsibilities are shared equally, students and teachers have reported that having two teachers in the classroom is beneficial, even if the teaching responsibilities are not shared equally (Preston-Smith et al., 2020). A questionnaire given to 99 students in 17 co-taught high school science classrooms sought students’ perspectives on the roles of general and special education teachers in inclusive classrooms. Of the 395 students eligible for the study, disproportionate stratified random sampling selected 202 individuals to ensure

representation from students with and without disabilities and 99 completed the questionnaire and provided enough information for analysis. Although these students shared that special education co-teachers in content-area classes didn't always have sufficient content knowledge to deliver instruction, 93 of the 99 respondents indicated that having two teachers in the classroom was beneficial (Preston-Smith et al., 2020). The authors did not include a calculation of effect size, so the strength of their findings cannot be determined. Gathering student feedback on the roles of both co-teachers provides actionable information to adjust instruction and identify areas where special education co-teachers could take a more active role in classroom instruction (Johnson & King-Sears, 2020; King-Sears & Jenkins, 2020).

Stratified random sampling was used to recruit 126 middle and high school general education co-teachers who completed a researcher-developed survey investigating the types of assessments used and how they used the data gleaned from those assessments in the decision-making process. The survey had good internal consistency, as measured by Cronbach's alpha of 0.82 for the items on assessment, 0.84 for the items on decision-making, and 0.86 for the items regarding co-teaching. The general education teachers reported increased feelings of effectiveness within the co-teaching relationship and that having a special education co-teaching partner allowed them to recognize better when students were struggling, provide targeted attention and assistance, and improve the feedback they could offer to students (Wherfel et al., 2022). However, the lack of content-specific training for special education co-teachers can lead to increased apprehension about delivering content-based lessons, as suggested

by a survey administered to 179 preservice special education co-teachers when asked about their comfort level delivering social studies lessons (Rodriguez, 2021). While the authors provide details about the review process for developing and revising the questions used on the survey, the only data reported is an average number for each of the Likert-type items, with no mention of effect size or any other statistical analysis or measure of the instrument's reliability. This missing information reduces the usability of the data to a suggestion that content-area training may be beneficial, without providing adequate support for the author's claim. Seeking special education teachers with dual certifications in special education and the content area in which they will teach or providing content-specific training for their subject area may allow special education co-teachers to assume a more active role in instruction within inclusive classrooms.

Although the recently published articles referenced here speculate that co-teaching can provide benefits for students by providing additional teacher support, additional accommodation for individual student learning needs and assistance for teachers, the self-reported nature of the studies, non-random selection of participants, and lack of effect sizes do not allow the researchers to confirm that co-teaching practices as outlined by Friend et al. (2010) are being reliably or consistently implemented in the classroom or have any influence on students' academic outcomes.

Information and Communication Technology (ICT)

There is mixed evidence that the use of ICT tools in classrooms can improve student outcomes for both neurotypical and students with disabilities. Many studies neglect to report effect sizes, were conducted with sample sizes as small as two students,

or are qualitative studies that cannot be generalized to a larger population. The literature regarding the use of ICT tools in general education and inclusive classrooms is discussed below.

Benefits of ICT Use for Neurotypical Students

Suggestive qualitative evidence and a recent meta-analysis that reported a medium positive effect of ICT literacy on academic achievement provide evidence that ICT tools can be used to improve student outcomes for students without disabilities. Ge et al. (2021) performed a qualitative case study to analyze the results of open-ended survey questions that were given to 704 students in Canada to learn about their experiences with ICT tools in classrooms. The students reported that while the use of ICT tools enhanced their interest in the course content and their engagement, promoted collaboration and helped improve communication skills, and provided opportunities for differentiation, ICT tools also created distractions that impaired their learning, and the students expressed a desire for teachers to teach self-regulation skills. These qualitative results suggest that ICT tools can provide academic benefit under certain conditions. An analysis of the link between ICT literacy and academic achievement for neurotypical students can be found in the meta-analysis of 50 effect sizes from 45 studies conducted by Lei et al. (2021). The authors analyzed 45 studies and calculated 50 separate effect sizes to investigate the link between ICT literacy and academic achievement to determine if a moderating effect exists for geographic location, demographic factors, study designs, and the assessment types. There was no moderating effect identified for geographic location ($p = > 0.05$), academic subject ($p = > 0.05$), publication type ($p > 0.05$), or

publication year ($p > 0.05$). Positive effects were found for applied ICT skills ($p < 0.05$, $g = 0.735$) rather than theoretical ($g = 0.489$), the largest effect size for age was seen in high school students ($p < 0.001$, $g = 0.937$), a larger effect was found for female students ($p < 0.01$, $g = 1.467$) rather than male ($g = -0.181$), and the authors reported stronger effects from randomized controlled experiments ($g = 0.944$) than convenience sampling. Their overall analysis revealed a medium to large positive link ($g = 0.644$) between the use of ICT tools and improved academic achievement for neurotypical students. Both studies show that appropriate use of ICT tools can improve learning outcomes for students without disabilities in schools.

Benefits of ICT Use for Students with Disabilities

For students with disabilities in the inclusive classroom, there can be a significant gap between students' abilities and the academic proficiencies they must display alongside their neurotypical peers, and implementation of ICT tools could be a strategy to increase their academic outcomes and narrow that gap (Andersen & Sorensen, 2017). Andersen and Sorensen (2017) conducted a year-long study with over 500 students in grades 1-10 in 11 schools in Denmark to investigate the impact of ICT interventions on the 54 focus learners included in the study, which is the authors' term for students with disabilities. Although the authors describe their study as a mixed-methods approach and the data analysis plan for the quantitative data is provided, the article contains only qualitative results and no discussion of effect size. With the lack of quantitative information, the qualitative results suggest that in this setting and under these conditions, ICT tools were beneficial for the focus learners and assisted them in learning the course

content, although not to the level of proficiency as their neurotypical peers. Kroesch et al. (2020) used a single-case multiple probe design to quantitatively determine the effect that ICT tools had on two high school students with disabilities' success in sequencing events in American government classes. While the study did report a small increase in understanding as a result of the ICT intervention for these two students as measured with start, baseline and intervention period scores, the lack of discussion about effect size and the extremely small sample size are sizeable limitations for the study. Additional studies with students with disabilities would be needed to determine whether ICT tools can conclusively improve learning outcomes for students with disabilities, although there is suggestive evidence that combining ICT tools with co-teaching could improve learning outcomes for students with disabilities in inclusive settings.

Drelick et al. (2024) propose a strategy that merges co-teaching and ICT tool use to benefit students with disabilities by redefining the role of the special education teacher in an approach they call "One Teach-One Tech." This article reviews the history of co-teaching and the six existing co-teaching models proposed by Friend et al. (2010) through the lens of lessons learned during COVID, hybrid, and virtual education spaces and the shift to incorporate more ICT tools into classroom instruction and makes recommendations about how co-teachers' roles should change to more seamlessly integrate ICT tools during instruction. The authors' supposition is that co-teaching teams can work within the existing co-teaching models to redefine the role of the special education co-teacher and delegate the tasks of technology management during a class to use ICT tools to provide more individualized instruction. In this way, the authors argue,

both co-teachers have the opportunity to play an expanded or lead role during instruction, rather than the special education co-teacher assuming a more passive role in the frequently-used one teach-one assist model (Alnasser, 2021; Preston-Smith et al., 2020). This approach can provide students with alternate modes of assessment (using speech-to-text, video explanations, or word processing instead of handwriting), options for collaboration and communication that do not draw attention to the students' need for individualized support, and a chance to offer real-time feedback on student work. The authors' review of the existing literature is consistent with the lack of time provided to teachers to gain proficiency with ICT tools, the lack of training in the use of ICT tools, and the lack of technical support available for teachers.

Barriers to ICT Use in Inclusive Settings

Despite the suggestive evidence that ICT tools can improve student learning outcomes, the lack of proactive planning for students' needs, the financial cost associated with ICT tool subscriptions, and the lack of training for teachers on ICT use can create barriers to successful ICT implementation (Starks & Reich, 2023). A multiple case study conducted with 20 special education teachers used semi-structured interviews to gather information about teachers' experiences with technology integration before, during, and after the COVID-19 pandemic shift to remote learning. The participants shared that the choice of and access to software programs for differentiation were typically made at the district level without input from the special education teachers, with no guarantee that the programs implemented during the year would still be available by the end of the year or renewed for the following school year. For school districts whose decisions are reactive

rather than proactive, the cost of accessible technology solutions and the lack of options to meet students' needs creates gaps in accessibility for students with disabilities (Shaheen & Lohnes Watulak, 2019; Starks & Reich, 2023). A literature review of 647 articles on technology accessibility conducted by Shaheen and Lohnes Watulak (2019) in K-12 educational settings revealed that most of the research on accessibility is more than a decade old and focuses on the accessibility of websites rather than the accessibility and availability of ICT tools for differentiation. The article does illuminate the reactive nature of many school districts' decisions to wait until a specific need arises for a student rather than designing systems and choosing ICT tools that make learning materials accessible for students with multiple learning disabilities, which is echoed in the Starks and Reich (2023) article. Further and more timely research is needed on the accessibility of ICT tools for use in inclusive settings.

Lack of Training for Teachers. Even when accessibility of ICT tools is not an issue, teachers' access to professional development and training on the use of ICT tools in the classroom still acts as a barrier to implementation. Of the 20 participants in the Starks & Reich (2023) study, 18 reported that they had inadequate training on the use of ICT tools for instruction or differentiation and were left to gain proficiency and adapt the tools for classroom use on their own. The lack of training is echoed in the findings from a phenomenological study involving seven special education teachers in Mississippi conducted by Isgett and Wang (2021), who cited insufficient pre-service and in-service training and lack of support from district administration as barriers to ICT implementation. While the Isgett and Wang (2021) study and the Starks and Reich (2023)

study are both qualitative in nature and cannot be used to generalize to a larger population, their findings about the insufficient amount of training are consistent with the conclusions reported in current research on ICT use.

Lack of Communication. Co-teaching is defined by a partnership between general and special education teachers in the same classroom, and those partnerships require collaboration and communication to plan lessons and choose appropriate materials to meet the needs of students. Gaps in communication between co-teachers or between teachers and the district's information technology departments can create additional barriers to ICT implementation. Special education teachers in the Starks and Reich (2023) study shared that they were rarely consulted by general education teachers or included in the decisions about planning and instruction using ICT tools, which limited the special education teachers' ability to implement programs that would meet individual students' learning needs. The qualitative nature of the Starks and Reich (2023) study does not allow for generalization of the findings to a larger population or speak to the conditions in all school districts regarding ICT use and did not gather data regarding potential barriers surrounding students' race or ethnicity. However, the study did demonstrate an interrater reliability of 92% when double coded by a second researcher and does provide suggestive evidence that special education teachers may have an important perspective about the needs of SWD regarding ICT tools and the barriers to their use that should be considered when districts make decisions about ICT implementation or general education teachers make instructional decisions. Even when adequate training is available and teachers are conversant with ICT options, information

technology (IT) and special education departments often work in siloed school environments, creating significant communication gaps (Shaheen & Lohnes Watulak, 2019). Shaheen and Lohnes Watulak (2019) report from their literature review that IT departments have knowledge about ICT tools but not the specific needs of special education students, while special education teachers understand the needs of their students but not the ICT tools available. These interruptions in communication between general and special education teachers or IT departments and special education teachers can prevent districts from providing adequate and appropriate ICT tools that could benefit students with disabilities.

Rapid Release of ICT Tools. Even with adequate lines of communication between teachers and IT departments, the rapid release of new ICT tools, which far outpaces teachers' abilities to gain proficiency and adapt instruction to incorporate the new tools, combined with a lack of professional development and training, present additional barriers to ICT implementation. Four recent studies about ICT implementation concluded that the lack of training on the effective use of ICT tools in the classroom can hinder implementation, reduce long-term adoption, and therefore reduce the positive impact that such tools can have on student learning (Anderson & Putman, 2020; Isgett & Wang, 2021; Nicu & Bancila, 2019; Starks & Reich, 2023). Anderson and Putman (2020) conducted a qualitative study involving semi-structured interviews and classroom observations with eight elementary special education teachers about their experiences using ICT tools for students with disabilities. Their participants shared frustrations with the lack of training for ICT use and the periodic technology issues that prevented them

from consistently implementing ICT tools. The seven special education teacher participants in Isgett and Wang's (2021) phenomenological study echoed this same frustration and expressed that they felt overwhelmed by the lack of training for the multiple ICT tools used in their classrooms. Nicu and Bancila (2019) surveyed 748 teachers who attended professional development to use ICT tools in their classrooms and the qualitative analysis of the open-ended questions on their survey report that the respondents believe that professional development, training, and support for teachers' ICT use are needed for teachers to effectively implement ICT tools into classroom instruction. The lack of adequate training is echoed by 18 of the 20 participants in the qualitative study conducted by Starks and Reich (2023). Additionally, the rapid pace at which technological tools are developed and released allows insufficient time for teachers to become proficient in their use before incorporating them into classroom instruction or for empirical studies to demonstrate their effectiveness, as reported in an article review by Boyle and Kennedy (2019). While there appears to be evidence supporting the idea that teachers are not provided with sufficient training, professional development, or support to implement ICT tools effectively or confidently in their classroom, many recent studies are qualitative and the findings cannot be generalized to larger or varied populations, use relatively small sample sizes, and do not report effect sizes for their findings. Current research about which ICT tool to use is also problematic, as there needs to be more consistency with the data gathered to measure the efficacy of ICT tools for improving student outcomes.

Availability and Access to ICT Tools. Discrepancies in students' access to and skills using those ICT tools in inclusive settings create an additional barrier to ICT tool implementation. The rapid shift to remote learning during the COVID-19 pandemic revealed significant differences in students' availability and access to ICT tools and how students with learning disabilities struggled to learn with ICT tools at home, even when they had adequate internet access (Basham et al., 2020). Basham et al. (2020) examines the ICT use for students with disabilities in the aftermath of the COVID-19 pandemic and makes recommendations to leverage ICT tools to meet the diverse learning needs of students with disabilities, although the authors neglect to report their inclusion criteria for the selection of articles for their review or the article analysis that led to their conclusions. A more recent investigation by Dlamini and Rafiki (2023) surveyed 1050 teachers in South Africa about ICT integration with Likert-type questions and correlation analyses revealed moderate effect sizes for the correlation between access to connectivity and a laptop ($r = .402$) or computer ($r = .431$) and the largest effect size for the correlation between experience with computers and the internet ($r = .755$). Students learning in both urban and rural areas experienced disruptions in internet access, inadequate educational support from caregivers who were unprepared to take on the role of co-instructor for their children, and many students had increased family responsibilities as older siblings were given childcare duties for younger siblings (Basham et al., 2020; Chandra et al., 2020). Chandra et al (2020) analyzed demographic data and published a report on the digital divide and the educational inequity that was revealed by the rapid shift to remote learning due to COVID-19. Their report

corroborates the findings from the Basham et al. (2020) study. Participants in the Starks and Reich (2023) study reported that inequitable access to devices and insufficient allocation of resources for students with disabilities to access both hardware (computers) and internet resources also influenced teachers' decisions about whether to incorporate ICT tools into classroom instruction.

Summary and Conclusions

In the chapter, I reviewed the history of co-teaching that led to the current co-teaching models found in modern inclusive classrooms, the possible benefits and challenges to co-teaching, the need for co-teacher training to facilitate collaboration and communication, and the need for administrative support in the allocation of time and resources for co-planning and collaboration. Also discussed was the use and benefit of ICT tools with both general and special education students and the barriers or challenges with implementing ICT tools in classroom settings. The study is framed by the UTAUT, which investigates the performance expectations, effort expectancy, social influence, and facilitating conditions that predict the likelihood that an individual will adopt a particular ICT solution.

Co-teaching began by pairing two teachers together in the same classroom to share instructional duties and responsibilities for a group of students (Friend et al., 2010; Trump, 1966). Increasingly, school districts have implemented co-teaching as a way to allow students with disabilities to receive their education in the least restrictive environment, believing that having two teachers in the room provides the needed accommodations (Individuals with Disabilities Education Act, 2004; Rhodes, 2021).

Studies have reported that students with disabilities in inclusive settings can have improved academic achievement (King-Sears et al., 2021), improved social interaction with peers (Tryfon et al., 2021), and increased engagement and focus (Preston-Smith et al., 2020). However, challenges to co-teaching claim that there are inconsistent criteria for including students with disabilities in the general education classroom, where they may not receive the level of support needed (Weiss & Rodgers, 2020). Teachers frequently report a lack of training for co-teaching practices (Ansari Ricci et al., 2021; Lindner & Schwab, 2020; Preston-Smith et al., 2020), which often leads to the special education co-teacher assuming the role of an assistant rather than an equal instructional partner (King-Sears & Jenkins, 2020; Olsen & Mason, 2023; Starks & Reich, 2023; Weiss & Glaser, 2021).

Incorporating ICT tools into classroom instruction is one possible solution to make the needed accommodations and modifications to the curriculum materials for students with disabilities (Andersen & Sorensen, 2017; Kroesch et al., 2020) and remove some of the barriers to learning experienced by students with disabilities (Starks & Reich, 2023). However, teachers rarely have access to adequate training (Anderson & Putman, 2020; Basham et al., 2020; Isgett & Wang, 2021), school districts often make decisions based on funding and without teacher input (Starks & Reich, 2023), and communication barriers exist between special education teachers and the information technology departments who install ICT tools (Shaheen & Lohnes Watulak, 2019).

Current research on co-teaching has explored the development of the co-teaching relationship between the general and special education co-teachers, the need for

additional training in co-teaching and collaboration skills, and the benefits and challenges of co-teaching for students with disabilities. The current research on the use of ICT tools in classrooms focuses on the increase in academic outcomes for students with and without disabilities, the challenges with selecting and implementing ICT tools in classrooms, and repeats a need for training for teachers. What is missing in the current research is the role that special education co-teachers play in the shared decision-making process to adopt and use ICT tools in their classroom practice.

This study investigated the experiences of secondary special education co-teachers in the adoption and use of ICT tools in inclusive classrooms. The findings from the study may reveal opportunities during the shared decision-making process for special education co-teachers to use the knowledge of their students' specific learning needs to advocate for the adoption and use of ICT tools that could benefit their students. The next chapter details the methodology that will be used for the study and contains a discussion of the ethical concerns for participants and issues of trustworthiness regarding the credibility, transferability, dependability, and confirmability of the findings from the study.

Chapter 3: Research Method

The purpose of this qualitative study was to investigate the experiences of secondary special education co-teachers in the adoption and use of ICT tools in inclusive classrooms. The beginning of this chapter outlines the research design and rationale and my role as the researcher. The next section includes an outline of the study's methodology, research questions, participant selection criteria, and data analysis plan. In the final section of the chapter, I outline the treatment of data, issues of trustworthiness, and ethical concerns for participants.

Research Design

RQ: What are the experiences of secondary special education co-teachers in the adoption and use of ICT tools in inclusive classrooms?

The central interest of the study is the specific experiences of secondary special education co-teachers who work in partnership with general education co-teachers in inclusive classrooms as they implement and use ICT tools in their inclusive, co-taught classrooms to differentiate instruction for their students with disabilities. I chose a basic qualitative approach for this study. This approach allowed me to gather information about the experiences of participants and the meaning that participants ascribe to those experiences, as described by Burkholder et al. (2016) and Merriam and Tisdell (2016). Semistructured interviews provided an opportunity to pose in-depth questions and adjust the interview speed or ask follow-up questions to understand better the participant's experiences (Burkholder et al., 2016; Rubin & Rubin, 2012). This inductive, constructivist approach allowed patterns to emerge during the data analysis to help

understand how the special education co-teachers construct meaning from their experiences in inclusive classrooms regarding ICT implementation (Merriam & Tisdell, 2016).

Rationale for the Research Approach

A review of the types of research designs led to the selection of a basic qualitative study. The rationale for not selecting a case study, narrative, ethnography, phenomenology, or grounded theory approach is discussed in this section.

Case studies analyze contextual data gathered from a system with defined boundaries (Dooley, 2002). Within the context of education research, these boundaries can include a single school district or school building. Multiple types of in-depth data collection methods are used, such as interviews, documents, observations, and reports, to provide a detailed picture of the experiences of a defined group of individuals, with data collection methods added as needed to enhance understanding of the participants' experiences (Dooley, 2002). The prospective participants for my study included participants from across the United States, and it is, therefore, not a bounded system. As the co-teachers recruited to participate in the study did not have common experiences with the same district or program, this approach was not chosen.

A narrative study examines the experiences of individuals through the stories they relate (Clandinin, 2007). Clandinin (2007) explains that the researcher forms a relationship with the participants as data are gathered in the form of words and stories, and understanding the context of the stories is a critical part of the analysis. The current study focuses on the experiences of secondary special education co-teachers without an

emphasis on the chronology of those experiences or the specific contexts in which the participants had their experiences. Therefore, a narrative approach would not be appropriate.

Ethnography studies seek to capture the experiences of a group that share a common culture or set of shared beliefs, patterns, or values in their natural setting (Atkinson et al., 2001). The researcher is the instrument of research as they are immersed in the culture of the studied group to make observations and create field notes containing their thoughts, feelings, and insights to create a thick description of the participants' culture. The focus of this study was to learn about the experiences of secondary special education co-teachers who may work in different school districts and have different school climates regarding the adoption of ICT tools in their classrooms. The geographic separation of participants prevents the researcher's immersion into the culture experienced by the participants and is, therefore, not the approach chosen for this study.

A phenomenological approach studies the meaning that individuals ascribe or the essence of a shared phenomenon (Moustakas, 1994). The researcher outlines the situation that defines the phenomenon, and all participants must have experienced this phenomenon. After data collection using interviews, researchers perform reflective analysis to look for patterns in the lived experiences shared by participants and find and report the essence of those experiences. As the purpose of this study was to examine the experiences of secondary special education co-teachers as they adopt and use various ICT tools, and they will not have experienced the same phenomenon, this approach was not chosen.

A grounded theory approach uses the data gathered from participants to develop a theory (Corbin & Strauss, 2008). Corbin and Strauss (2008) explain that grounded theory aims to understand the participants' realities, though the experiences, responses, and beliefs of those participants are complex and varied. The interaction of the researcher, the participants, and the data helps to shape the understanding of the phenomenon under investigation. As the study's intent was to explore the experiences of secondary special education co-teachers and not to develop a new theory, this approach was deemed inappropriate.

Role of the Researcher

I was the observer and the primary data collection instrument using semistructured interviews (Merriam & Tisdell, 2016). As the primary data collection instrument, I interacted with the participants during the semistructured interviews and my prior experiences with co-teaching may have introduced personal bias to the data collection and analysis (Ravitch & Carl, 2021). I am currently a secondary science teacher in a large suburban public high school. I have been the general education co-teacher partnered with a special education co-teacher in inclusive classrooms for over a decade. During that time, I have worked with six different special education co-teachers as co-teaching partners, and I have experienced the development of those co-teaching relationships from a general education teacher's perspective. While these experiences provide me with a unique insight into the development of co-teaching relationships and the decision-making process from the perspective of a general education co-teacher, this firsthand knowledge could also be a significant source of bias. I also used a reflective

journal throughout the study to examine, record, and account for personal biases and maintain objectivity (Patton, 2015). Capturing my thoughts, feelings, and perceptions during the data-gathering and analysis processes helped me recognize and reduce the influence of my personal biases on my participants' contributions and the study's findings.

I used my professional network of teachers to seek recommendations for potential participants outside of my school district of employment. The search for participants was not confined to a specific area of the United States and yielded participants and perspectives from a variety of school districts. Any potential participants with whom a prior relationship exists were excluded from participation in the study. Teachers in my current school district or those already known to me were not eligible to participate. No supervisory or instructor relationships existed with any participants, as they were employed by school districts unfamiliar to me. Therefore, no researcher bias based on prior relationships or unequal power dynamics was a factor. Participants were recruited and secured using my professional network, and no organization was directly involved in securing participants for the study. Adherence to the wording of the questions in the interview guide helped prevent the introduction of personal bias into data gathering. Recording my thoughts, perceptions, and observations in a reflective journal throughout the research process helped identify and reduce bias during data collection and analysis.

Methodology

This section details the participant selection logic, the development of the instrumentation used to gather data, procedures for recruitment, participation, and

collection of data, the data analysis plan, a discussion of the measures taken to increase trustworthiness in the study, and the procedures to ensure that ethical and legal guidelines are followed during the research process.

Participant Selection Logic

The target group of interest was secondary special education co-teachers who work in inclusive classrooms in partnership with a general education co-teacher. Through the use of purposive sampling, I located participants who met the inclusion criteria, as the perspectives sought are those of secondary special education co-teachers, a specific population, as suggested by Burkholder et al. (2016). The co-teachers selected for the study are those who work in a secondary co-taught classroom, have worked with the same co-teaching partner for more than one school year, and who incorporate ICT tools into their instruction. School district or building administrators, paraprofessionals, teaching assistants, and general education teachers were excluded from the study as they did not fit the inclusion criteria and could not provide relevant information to address the research questions. Participants established their suitability for inclusion by answering questions about their role, job title, length of relationship with their co-teaching partner, and school district of employment asked in the email invitation. If potential participants did not work in the researcher's district of employment, are secondary special education co-teachers who work in partnership with a general education co-teacher, have worked within that co-teaching relationship for one year or longer, and incorporate ICT tools into their instruction, they met the inclusion criteria.

The goal was to collect data by interviewing between 8-12 secondary special education co-teachers using a virtual conferencing platform. This number of participants aligns with Guest et al.'s (2006) assertion that meta-themes begin to emerge after six interviews and that saturation occurs within the first 12 interviews. The target population was secondary special education co-teachers who work in inclusive classrooms in partnership with general education co-teachers, a homogeneous population in which individuals share common perceptions and experiences in teaching. Guest et al. (2006) argue that 12 interviews should be sufficient to understand the experiences of homogeneous populations.

Recruitment information and participation invitations were distributed to my professional network via email and social media platforms. Snowball sampling was used to secure additional participants when the initial response did not yield the desired number of 8-12 participants. An email invitation was sent to potential participants to explain the nature of the study and ask questions to determine whether the individual meets the inclusion criteria, as explained above. Participants who met the inclusion criteria were sent the informed consent form, more detailed information about the study, and an invitation to participate in an interview. Participants who signed and returned the informed consent form and agreed to participate were contacted by email to arrange a time to conduct and record the interview using the Zoom video conferencing platform.

Interviews continued with additional participants until the participants' responses did not reveal a unique insight into the phenomenon, and the data collected provided adequate information to answer the research question, which indicated that saturation had

been reached (Cober & Adams, 2020). A recent systematic review of qualitative studies that address saturation was consistent with prior research and revealed that an average of 12-13 participants was sufficient to reach saturation when in-depth interviews were the method of data collection (Guest et al., 2006; Hennink & Kaiser, 2022). Based on these established guidelines, the desired sample size of 12-15 participants allowed me to reach saturation for this basic qualitative study.

Instrumentation

I used a researcher-developed instrument to gather data during interviews with participants. This researcher-developed instrument consisted of a set of questions and follow-up probes on an interview guide used during the semistructured interviews during data collection.

Rather than using an established set of interview questions, I referred to Patton (2015) and Rubin and Rubin (2012) to develop a protocol and an interview guide that more closely fit the research questions for the study and the nature of semistructured interviews. An introductory statement was read verbatim at the beginning of the interview, and a debriefing statement was read at the conclusion of the interview (Rubin & Rubin, 2012). The interview questions were drawn from the UTAUT, which is the conceptual framework for the study, and were specifically developed for use in this study and to provide data to answer the research questions (Venkatesh et al., 2003). An interview guide helped to increase consistency during the interviews and helped ensure that the data gathered address the research questions (Rubin & Rubin, 2012).

The first section of the interview guide contains questions to seek information about participants' experiences in the adoption and use of ICT tools, which will address the perceived usefulness of ICT tools and provide insight into the performance expectancy for the tools adopted. This first section also addresses special education co-teachers' comfort level in implementing ICT tools and the effort expectancy in incorporating those tools into classroom instruction. The second section of questions solicits information about the influence of the special education co-teacher's relationship with their general education co-teaching partner on ICT tools and provides insight about the social influence for adoption decisions. The third section of questions on the interview guide investigates the facilitating conditions in the co-teacher's district or building by asking about the level and type of support offered for ICT implementation.

The questions and probes on the interview guide directly address the special education teacher's adoption of ICT tools from each of the four factors described in the UTAUT that contribute to the adoption of ICT tools: performance expectancy, effort expectancy, social influence, and facilitating conditions (Venkatesh et al., 2003). The questions about the ICT tools used in the participants' inclusive classrooms provided information about performance expectancy and effort expectancy, the co-teaching information questions addressed the social influence, and the resources and support addressed the facilitating conditions that contribute to the adoption of ICT tools.

A pilot study was conducted with secondary special education co-teachers to gather feedback on the alignment of the interview questions with the study's research questions and adjust the wording of questions on the interview guide to ensure clarity and

to increase the likelihood that participants' responses will provide information to address the research questions.

Pilot study participants were secondary special education teachers with whom I am acquainted and who consented to read, evaluate, and provide feedback on the questions on the interview guide. An email was sent to potential participants with a description of the pilot study, the pilot study's purpose, and an invitation to participate in the pilot study. The invitation explained the type of feedback sought and explained how that feedback was used to revise and improve the interview guide questions to better align with the research questions. The email also explained that their participation and any potential responses to the interview questions provided will not be included in the final study, as the pilot study participants are known to the researcher and therefore do not meet the eligibility criteria for the study. Informed consent was obtained via email from each pilot study participant before entering the pilot study. The finalized interview guide reflects the changes made based on the pilot study and is included in the Appendix.

The purpose of the pilot study was to gather feedback about the wording and order of the questions on the interview guide and use that feedback to revise the questions, develop probes, and more closely align the interview questions with the research questions and the conceptual framework for the study. These revisions increased the likelihood that the data gathered during the interviews with study participants provided data to directly address the study's research questions. None of the contributions of the pilot study teacher participants were included in the data analyzed for the final study.

Procedures for Recruitment, Participation, and Data Collection

Information about the study and the selection criteria for participants were distributed through social media and email to my professional network. Potential participants completed questions on a Google Form to determine their suitability for participation. The participant selection logic section above details the criteria needed for respondents to be selected for the study. Individuals selected for participation received an informed consent form via email that had to be returned before scheduling their interview. I negotiated appointment times for interviews by email. I was the sole data collection instrument and I was the only researcher conducting the semistructured interviews for the study.

The initial distribution of invitations for participants yielded too few participants so an additional request was sent to my professional network for participant recommendations. Follow-up phone calls with selected individuals and outreach on social media within that network did yield enough participants.

Data collection occurred within a single interview session conducted using the Zoom platform. The interviews took between 30-45 minutes and follow-up interviews were not necessary. The participants received an individual link to access the secure online meeting at the specified date and time. When the participants entered the Zoom meeting, they were greeted, the introductory statement on the interview guide was read to establish the purpose of the interview, the participants were informed that identifying information would be removed and their responses will remain confidential, they were asked if they had questions about the process, and I obtained verbal permission to record

the interview for transcription purposes. Participants were not required to activate their cameras and were informed that they could keep them off for the duration of the interview. Interviews were recorded using the Zoom platform software and the recordings stored on a local hard drive within my residence.

Transcripts were generated from the audio recordings after each interview concluded. To verify accuracy, transcripts were emailed to each participant to check for errors. The participants had the opportunity to offer corrections for the transcript before data analysis began. There were participants who chose to engage their cameras during the interviews. As the video recordings were viewed to generate the transcripts, I recorded impressions, thoughts, and observations in my research journal. This helped to identify and minimize bias.

The debriefing statement at the end of the interview guide was read verbatim at the conclusion of the interview. This statement thanked the participants for their time, assured them that the information they have provided will remain confidential, reminded them that all names and personally identifying information would be removed before finalizing the study, and notified them that a transcript of their interview would be sent via email to verify accuracy. I also let them know that I would share a summary of my findings from the study, as a show of respect for their time and willingness to participate (Rubin & Rubin, 2012). As a thank you for their time, each participant who completed the interview received a \$20 Amazon gift card.

Data collection was intended to occur in one interview session without the need for follow-up interviews. All interviews were conducted within one interview session and I did not need to contact any participants for follow-up interviews.

Data Analysis Plan

The data collected during the study came from semi-structured interviews conducted with each participant. The interview questions were written to solicit information about the participants' perceptions and experiences regarding ICT tool implementation in secondary inclusive classrooms.

After each interview concluded, a transcript was generated using the voice dictation tool in Microsoft Word. For any participants who chose to activate their video cameras, I recorded thoughts and impressions in my research journal as I rewatched the recorded interview. I took note of the participant's body language, tone of voice, and non-verbal communication cues such as eye contact and facial expressions. If participants chose not to activate their cameras, impressions and information about the participants' tone of voice, length of pauses before answering questions, or other auditory sources of non-verbal communication were recorded from replaying the audio as I verified the accuracy of the software-generated transcript and made any needed corrections. The corrected version of the transcript was emailed to each participant with a request for them to verify the accuracy of the written transcription and identify any further corrections that were needed.

The Quirkos software program was used for coding and data analysis. The program was purchased and stored locally on my computer and did not use cloud-based

storage or analysis options. The visual nature of the interface allowed me to identify, compare, and organize codes for multiple participants simultaneously (Quirkos – Qualitative Data Analysis Software Made Simple, 2023).

Since the research questions sought to understand the experiences and perceptions of the target group of participants, it was appropriate to use the inductive coding methods of In Vivo and focused coding (Merriam & Tisdell, 2016; Saldaña, 2016). The interview questions sought the participants' experiences in the adoption and use of ICT tools in inclusive settings. The questions on the interview guide were structured to gather specific data about the performance expectancy, effort expectancy, social influence, and facilitating conditions that influence the adoption of ICT tools for the target group of participants.

After the interviews had been transcribed, data analysis began with open coding to search for patterns (Burkholder et al., 2016). As a novice researcher, it was difficult to predict which coding method would be most appropriate for analyzing the data collected during the study. Saldaña (2016) outlined 26 different first cycle coding methods and explained that each method could be used in multiple ways. For the first cycle coding I planned to use a combination of In Vivo codes captured from the participants' words to honor their experiences and voices, structural codes with content-based phrases that align with the research questions and the conceptual framework, and descriptive coding to summarize participants' thoughts and perceptions (Saldaña, 2016). Utilizing more than one method of first cycle coding allowed me to look at the data from more than one angle and more easily identify the categories and themes that emerged from the interview data.

The questions on the interview guide are aligned to the four conditions outlined in the UTAUT and sought information from the participants about the performance expectancy, effort expectancy, social influence, and facilitating conditions that contribute to an individual's likelihood to adopt ICT tools (Venkatesh et al., 2003).

Second cycle coding examined the codes generated from the first cycle coding and used focused coding to reorganize them into categories and themes based on similarities (Saldaña, 2016). The In Vivo, structural, and descriptive codes created during the first cycle coding were condensed and patterns in the data identified.

The Quirkos software program was used to code the interviews and analyze the data. The software program was downloaded to my local computer and all data was stored and analyzed locally rather than using cloud-based storage.

The plan for discrepant cases that did not fit within the established pattern was to reexamine the existing codes to determine whether the new data would require recoding and reorganization of existing data or if the boundaries of the existing codes should have been expanded to include the new information (Patton, 2015). The recursive coding process could make space for and incorporate the new data into the identified patterns and themes. There were no discrepant cases included in the data analysis or findings for my study.

Issues of Trustworthiness

Trustworthiness in qualitative studies involve strategies to increase credibility, transferability, dependability, and confirmability (Patton, 2015). This section outlines the

procedures and strategies to minimize bias, increase objectivity, and improve the trustworthiness for my study.

Credibility

Credibility refers to the systematic, objective search for patterns in the data to ensure that the findings are connected to the data gathered and address the research questions for the study (Patton, 2015). I conducted practice interviews with a small group of teachers from the target population to ensure that data gathered using the interview guide generated data to answer the research question. These interviews are not included in the dissertation and were used only to refine the interview questions and increase credibility.

Another strategy to ensure credibility is member checking (Burkholder et al., 2016). Verbatim transcripts were generated immediately following the conclusion of the interviews, verified by the researcher for accuracy, shared with the participants, and a request made for them to verify the accuracy of the transcript. The original plan included sharing the initial codes with the participants to gather feedback and make sure that their experiences were accurately represented in the analysis. Due to the recursive nature of the coding process and the multiple coding strategies employed in the analysis of the data, initial codes were not shared with participants. Instead, a summary of the study's findings were shared with participants to validate the interpretation of the data (Burkholder et al., 2016; Patton, 2015).

Transferability

Transferability refers to the ability to use the findings from one's study to generalize to a larger population of interest, which for this study is secondary special education co-teachers who work in inclusive settings (Burkholder et al., 2016). While the findings for qualitative studies are not typically generalizable to a larger population, the search for participants was not confined to one area of the country or one content or subject area. This broad search helped to increase the variation of the participants and the possibility that the dissertation's findings could be transferred to a larger population consisting of secondary special education co-teachers. Along with the in-depth information provided by the interviews and detailed descriptions of the interview setting, the variation in participants represented by a nationwide search for participants could help increase the transferability of the findings (Burkholder et al., 2016).

Dependability

Dependability refers to the consistency with which data are collected, analyzed, reported, and any departures from the chosen methodology are documented (Burkholder et al., 2016). An interview guide was developed to ensure consistency in the collection of data during the individual interviews. The written questions provided a guide to ensure that the participants provide the desired data, though the nature of semi-structured interviews called on me to be responsive to the information provided by the participants, and questions and probes were adjusted as participants shared their experiences (Rubin & Rubin, 2012).

To further increase dependability during the data analysis process, an audit trail recorded detailed descriptions of the interview process, data gathering, the way codes were used, the way categories were determined, and included analytic memos after each interview and round of coding (Burkholder et al., 2016; Merriam & Tisdell, 2016). Analytic memos were recorded after each interview, and any anomalies in the data-gathering process were noted. Lincoln and Guba (1982) explain that an audit trail ensures that the data collection and analysis methods are appropriate for the study's problem and purpose, that the reports included in the study are logical and coherent, and that the conclusions reported in the findings are consistent with and directly connected to the data gathered during the study. Details for any deviation from the wording or order of the questions during the interview were included in the analytic memos. Inconsistencies were noted and included in the reporting of data.

Confirmability

Confirmability ensures that the data collection and analysis are performed in a reasonable, rational, and objective manner (Lincoln & Guba, 1982). In this qualitative study, I was the primary data collection instrument. Reflexivity explains how the perspective and views of that researcher shapes how the data are collected and analyzed and provides a record of the process used to improve objectivity and identify and reduce researcher bias (Ravitch & Carl, 2021). Ravitch and Carl (2021) recommended writing researcher memos after interviews to provide connection between data collection and analysis and maintaining a research journal to provide opportunities for focused reflection and thought about the research process. Both of these strategies were utilized

during the study to help tell the story behind the research decisions made during the dissertation process and illustrate the reflexive nature of qualitative research (Burkholder et al., 2016).

Ethical Procedures

Of primary importance in conducting research is to ensure that ethical and legal guidelines are followed when interacting with participants and that the research process does not cause harm during or after the research has concluded (Babbie, 2017). The following section outlines the procedures established for this study to ensure the safety of the participants, procedures for the recruitment of participants, and the treatment of the data gathered during the study.

All documentation relating to informed consent, voluntary participation, and treatment of participants follow IRB guidelines and use the approved IRB language and format. Documents sent to participants and potential participants used the authorized IRB templates.

The only existing relationships were with a professional network of teachers who were asked to circulate the invitation to potential participants. No prior relationship existed with the participants themselves. Teachers in my current school district or those already known to me were not eligible to participate. An email questionnaire determined whether the potential participants meet the inclusion criteria.

An Amazon gift card was offered to participants who successfully completed the interview. During the interview process, if it was discovered that the participant was untruthful in reporting their teaching experience or placement within a secondary

inclusive co-taught class for the purpose of obtaining the gift card, the participant would have been informed that they do not meet the inclusion criteria, the interview would be terminated, and the participant informed that they will not receive the gift card because they were not able to complete the interview process. The contributions from that participant would not be included in the analysis or findings. There were no participants who misrepresented themselves on the initial interview questionnaire and so no participants were excluded on this basis.

For potential participants who met the inclusion criteria, the approved IRB informed consent form, modified only to contain the estimated time needed to complete the interview, was emailed and was returned before interviews were scheduled with participants. Consent was obtained via email before scheduling interviews, and verbal consent to interview and record the interview was obtained at the time of the interview. Transcripts of the interview were provided to the participants after the interview concluded, and permission to use the interview in the study was obtained before the interview's contents were included in the analysis.

Interviews were conducted using the Zoom video conferencing platform, which uses end-to-end encryption for all online meetings (End-to-End Encryption for Meetings, 2022). Meetings were conducted from my private residence rather than a public setting, to prevent others from overhearing the questions or the participants' responses. Participants were encouraged to complete the interview in a private or non-public space. Participants were not required to activate their cameras during the Zoom interview. Participation in the study was entirely voluntary and participants were reminded at the

beginning of the interview that they could stop their participation and terminate the interview at any point in the process. There was minimal risk of harm to the participants, who did not share sensitive information and do not belong to a vulnerable population.

It was critical to establish trust with participants by ensuring that all data will remain confidential and any identifying information shared during the interview process will not be included in the findings (Rubin & Rubin, 2012). In addition, Rubin and Rubin (2012) also recommended sharing the codes identified in the data with the participants to ensure that their experiences were accurately coded and represented in the findings. Participants received an electronic copy of the interview transcript to check for the accuracy of transcription before data analysis began so that they could verify the accuracy of the transcript and offer corrections as needed.

All interview recordings and transcripts were stored on a personally owned external hard drive that is not connected to a cloud network and will not be removed from my residence at any time. The computer on which the data has been accessed, stored, and analyzed has a screen lock that engages after 15 minutes of inactivity, and all security and anti-virus software has been updated as needed. All data is in electronic formats as video and audio recordings or written transcripts in electronic formats and no physical printed materials have been used. As I am the sole researcher for this study, no collaborators will require access to the data. All data related to the study will be destroyed after five years.

Summary

This chapter contained a detailed outline of the methodology that was used to study the role that secondary special education co-teachers play in the adoption of ICT

tools in their inclusive classrooms. This outline contains a discussion of the research questions, rationale for selection of the basic qualitative approach, the role of the researcher and strategies to increase objectivity and minimize bias, the process for participant recruitment and selection criteria, the instrumentation used for data collection, the process for data collection, data analysis plan, and a discussion of the measures taken to improve the trustworthiness of the study.

Chapter 4: Findings

Introduction

The purpose of this qualitative study was to investigate the experiences of secondary special education co-teachers in the adoption and use of ICT tools in inclusive classrooms. The research question that guided the study was as follows: What are the experiences of secondary special education co-teachers in the adoption and use of ICT tools in inclusive classrooms? When framed by the conditions for adoption outlined in the unified theory of acceptance and use of technology (UTAUT), the results of the study may provide a more detailed understanding of how performance expectancy, effort expectancy, social influence, and facilitating conditions influence ICT adoption for this unique population and in this unique setting.

This chapter includes the findings from my qualitative dissertation study. This chapter begins with a discussion of the pilot study conducted to refine the questions for the interview guide, an explanation of the setting for the interviews and the influence that may have on the results, the demographics of the study participants, procedures for data collection and data analysis, issues of trustworthiness, and then the study results, organized by the four conditions for adoption outlined in the UTAUT.

Pilot Study

Before beginning interviews with participants, I conducted a pilot study with secondary special education co-teachers with whom I am acquainted to gather feedback on the alignment of the interview questions with the study's research questions, to adjust the wording of questions on the interview guide to ensure clarity, ensure alignment with

the conceptual framework, and increase the likelihood that participants' responses will yield rich data as they address the research questions.

Pilot study participants are current colleagues and were informed that their participation and any potential responses to the interview questions would not be analyzed and included in the final study since they did not meet the eligibility criteria for the study. Colleagues were given a description of the pilot study, the pilot study's purpose, and an invitation to participate in the pilot study. The invitation explained the type of feedback sought and explained how that feedback would be used to revise and improve the interview guide questions to better align with the research questions. The finalized interview guide used for the study and included in the Appendix reflects the changes made based on the feedback gathered during the pilot study.

Setting

Thirteen secondary special education co-teachers participated in individual semistructured interviews. The participants came from several different U.S. states, taught in schools in urban, suburban, and rural areas, and taught a variety of different content areas. They were not acquainted with each other and were not affiliated with an educational agency.

All interviews were conducted via Zoom video conferencing at times that were chosen by the participants. All participants completed the interviews in their classrooms or homes. Interruptions during the interviews were brief and included colleagues stopping by, pets making noises, or spouses asking a question. None of these interruptions seemed to derail the participants' responses or interrupt the flow of the interviews.

Demographics

Participants for the study were recruited using my professional network. Social media posts and individual emails were sent to members of my professional network with a request to circulate the study invitation, inclusion criteria, and to ask for participant recommendations. After an initial screening of the potential participants for eligibility, an informed consent form was sent via email. After informed consent to participate was obtained, Zoom interviews were scheduled and semistructured interviews were conducted with 13 participants who were all secondary special education co-teachers who have worked in an inclusive setting with a general education teacher for at least one year. The participants represent four different U.S. states and nine different school districts and teach in rural, suburban, and urban districts.

Table 2

Participant Demographic Data

Participants	Gender	School Area	Socio-economic Level	Years Co-teaching
1	Female	Suburban	Middle class	8
2	Female	Rural	Poverty	2
3	Female	Rural	Poverty	3
4	Male	Suburban	Upper middle class	2
6	Female	Suburban	Poverty	5
7	Female	Suburban	Poverty	3
8	Female	Suburban	Middle class	2
9	Female	Suburban	Middle class	4
10	Female	Urban	Poverty	2
11	Female	Suburban	Middle class	4
12	Female	Suburban	Middle class	7
13	Female	Suburban	Lower middle class	10

Data Collection

Semistructured interviews were conducted with 13 secondary special education co-teachers. All interviews were conducted between August 2023 and March 2024 using

the Zoom video conferencing software. Each interview took between 30-45 minutes to complete, and data collection occurred during this single session for each participant. Permission was obtained at the beginning of the interviews to record the interviews for transcription purposes. I used the audio recordings from the interviews and the voice-dictation tool in Microsoft Word to generate transcripts, and I proofread and corrected errors in transcription before the transcripts were sent to participants for verification of accuracy or corrections. Errors in transcription were minor, consisting mainly of spelling mistakes in the names of ICT tools used in the classroom or the names of district-specific programs. Email confirmation of the accuracy of the transcripts was obtained from all participants before the data in the transcripts were analyzed. This procedure followed the data collection plan presented in Chapter 3.

At the conclusion of one of the participant interviews, an anomaly was detected. The participant (P5) was a secondary special education co-teacher who works in partnership with a general education teacher, but during the interview, the participant revealed that they recently changed schools and, therefore, did not have 1 year's worth of experience with the same general education teacher. Therefore, the participant did not meet the inclusion criteria. That participant's responses (P5) were not analyzed with the rest of the data collected and are not included in the final study. Therefore, only the responses from the 12 eligible participants were analyzed and are included in the findings described here.

Data Analysis

The data analysis plan procedure outlined in Chapter 3 indicated that I would engage in an iterative coding process using a mixture of In Vivo coding, structural coding, and descriptive coding (Burkholder et al., 2016; Merriam & Tisdell, 2016; Saldaña, 2016). As a novice researcher, I found it helpful to first organize the data using structural codes that align with the conditions for adoption outlined in the UTAUT. The interview guide provided a roadmap for the questions asked, but the semistructured nature of the interviews meant that the questions were not always asked in a linear fashion. I adjusted the timing and order of questions and the probes to solicit responses that would provide data on the conditions for adoption outlined in the UTAUT while attempting to maintain the flow of conversation and level of comfort for the participants. During the transcription process, I realized that while I did gather information pertaining to all of the questions on the interview guide during each interview, each participant was eager to focus on sharing different aspects of their experiences, and I allowed them to share freely.

Further analysis using descriptive codes derived from participants' responses allowed me to find patterns in their responses and identify where their experiences differed. Descriptive codes were added as I analyzed the data, which required additional passes through the interview transcripts to add responses to the new descriptive codes. This iterative process included splitting some of the descriptive codes into smaller categories to find similarities and differences in participants' experiences. The structural codes used were the four conditions outlined in the UTAUT for the adoption of ICT

tools: performance expectancy, effort expectancy, social influence, and facilitating conditions, which helped to align the participants' responses and the data analysis to the study's conceptual framework.

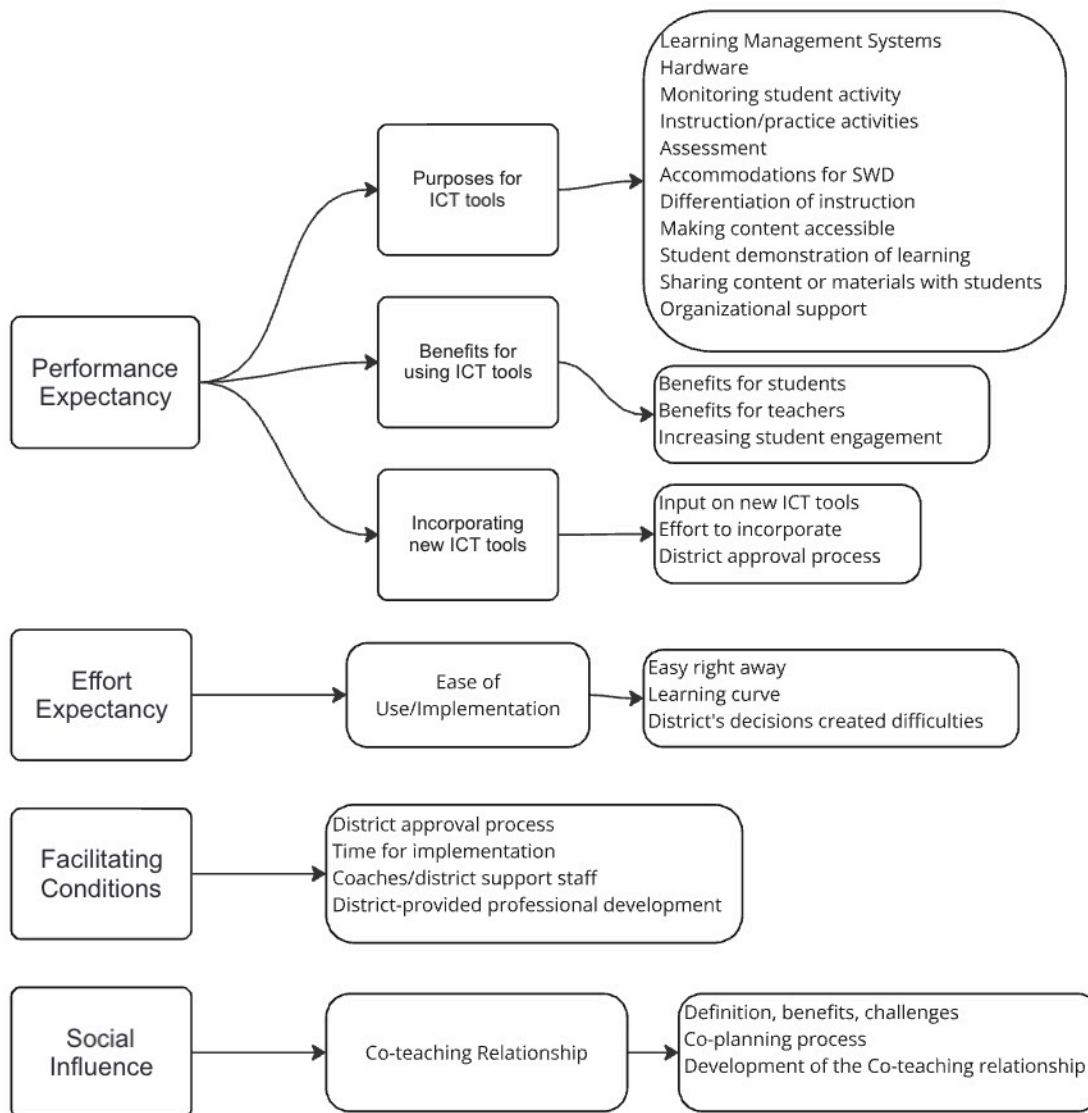
Within performance expectancy, the categories included the tools used, the purposes for ICT tools, the benefits of using ICT tools, and the process of incorporating new ICT tools. The purposes for ICT tools being used included learning management systems, hardware, monitoring student activity, instruction or practice activities, assessment, accommodations for students with disabilities, differentiation of instruction, making content accessible, demonstration of learning, sharing materials or content, and organizational support. The reasons the tools were selected detailed the benefits for students and benefits for teachers. The process of incorporating new ICT tools included the special education teachers' input on the choice of the tools, which overlapped with the effort expectancy and the facilitating conditions. Effort expectancy included categories involving ease of use, teacher learning curve, and student learning curve. The facilitating conditions included the district's approval process for incorporating new ICT tools, time for implementation, instructional coaches or support personnel, and district-provided professional development or training. Social influence involved the participants' definitions of co-teaching and the benefits and challenges of co-teaching, the process of co-planning, and the development of the co-teaching relationship.

There were no discrepant cases, as all participants included in the data analysis met the inclusion criteria, and the research question was to investigate the experiences of

secondary special education co-teachers in the adoption and use of ICT tools in inclusive classrooms.

Figure 1

Structural Codes and Emergent Themes



Evidence of Trustworthiness

Trustworthiness in qualitative research refers to the strategies employed to increase credibility, transferability, dependability, and confirmability (Patton, 2015). The following section discusses the strategies I used during this study to maintain trustworthiness.

Credibility

Credibility refers to the methods used to ensure that the findings are connected to the data gathered during the study, address the research question, and display an objective and systematic search for patterns in the data (Patton, 2015). A pilot study was conducted with secondary special education co-teachers with whom I am familiar, and their feedback on the research questions was used to refine the wording of the questions used in the interview guide.

I used the voice dictation tool within Microsoft Word to generate the transcripts, and the video of each interview was viewed twice for correction and verification of the transcript before being sent to each participant. Member checking was used to verify the accuracy of the interview transcripts and ensure that the participants' responses were captured accurately. The only errors identified were two spelling errors in the names of specific ICT tools used that were identified by two participants. Those two transcripts were corrected and sent back to the participants for verification of accuracy. All participants confirmed the accuracy of the transcripts via email before any data analysis occurred.

Transferability

While findings from qualitative studies are typically not generalizable to larger populations, I attempted to cast a wide net during the participant search in the hopes that I could secure participants with variation in their geographic locations, the communities in which they teach, the socio-economic levels of the school communities, and the subject areas in which they co-teach. My nationwide search secured 12 participants who represent nine U.S states, socio-economic levels from poverty to upper-middle-class communities, and teach in rural, suburban, and urban areas. Though all participants engaged in co-teaching at the secondary level, the variation in the participants' locations, school communities, and teaching conditions increases the chances that the findings could be transferable to a larger population (Burkholder et al., 2016).

Dependability

Dependability refers to the strategies used to ensure that data are collected, analyzed, and reported in a manner that maintains consistency (Burkholder et al., 2016). All interviews were conducted and recorded using Zoom video conferencing software. The same introductory statement was used verbatim at the beginning of each interview, and the same debriefing statement was read at the conclusion of the interview. The questions included in the interview guide, which was developed using Patton (2015) and Rubin and Rubin (2012) and refined using feedback from participants in a pilot study are aligned with the conditions for the adoption and use of technology outlined in the UTAUT, which is the conceptual framework for this study (Venkatesh et al., 2003). The adjustments to the questions in the interview guide helped to direct the flow of the semi-

structured interviews and provide data to address the research question. As participants provided responses to questions, probes were used to elicit information to address the research question and did not always match the exact wording on the interview guide. I adjusted the wording of the follow-up questions and probes to gather additional details about their experiences to address the research question while maintaining the flow of conversation and helping the participants feel comfortable during the interview process.

Confirmability

Confirmability refers to the practices employed to ensure that the collection of data and the analysis of the data occur in a reasonable and objective manner (Lincoln & Guba, 1982). As a general education teacher who has worked in inclusive, co-taught classrooms for 15 years, it was important for me to minimize my own bias during the interview process and the data analysis. The interview guide was developed to ensure that the questions asked during the semi-structured interviews aligned with the conceptual framework for the study and provided data to address each of the four conditions outlined in the UTAUT for ICT adoption. I recorded data collection notes in a reflective research journal at the conclusion of each interview and added reflections as I listened to the transcripts during the transcription process.

Results

This section reports the results of my study. The central research question investigated the experiences of secondary special education co-teachers in the adoption and use of ICT tools in inclusive classrooms. Transcripts generated after the semi-structured interviews were analyzed using the Quirkos qualitative data analysis software

program and reorganized into a spreadsheet to organize participants' responses. Initial coding used structural codes aligned to the conditions outlined in the UTAUT for the adoption of ICT tools. The themes that emerged from the data analysis aligned with the conditions for the adoption of technology outlined in the UTAUT and are: performance expectancy, effort expectancy, facilitating conditions, and social influence. Emergent coding in iterative cycles was used to identify patterns in the participants' experiences within those themes.

Performance Expectancy

In teachers' adoption of ICT tools in inclusive classrooms, performance expectancy refers to the degree to which the teacher believes that an ICT tool will improve teaching and learning conditions within the classroom (Venkatesh et al., 2003). Participants shared the ICT tools used in their inclusive classrooms, the instructional or accommodation needs those tools were chosen to meet, and the purpose or use for each of the tools. There was consensus among the participants that ICT tools can be useful and benefit both students and teachers, though teachers also shared some of the problems and challenges they experienced during implementation and use. They also detailed their experiences of the process of choosing and implementing new ICT tools.

Purposes for ICT Tools. As participants provided information about the tools used in their classrooms, I was able to group the tools into different categories, depending on the tool's purpose. Those purposes included learning management systems, hardware, monitoring student activity, instructional or practice activities, assessment, accommodations for students with disabilities, differentiation of instruction, making

content accessible, student demonstration of learning, sharing content or materials with students, and organizational support.

Learning management systems. Learning management systems serve as a central location for file storage, dissemination of assignments to students, a place to hand in completed work, data management for grades, and a vehicle to deliver accommodations to students with disabilities. Participants listed Branching Minds (P12), Clever (P10, P12), Google Classroom (P1, P9, P11, P12), Infinite Campus (P8), Schoology (P1, P4, P13), and SchoolTool (P12, P13) as the learning management systems in their schools.

P10 explained that Clever acts as a single sign-on, saying “we use Clever as our main portal and we access pretty much all of our apps through there.” P12 explained that “we use Google Classroom every day. The agenda is always posted in there, all the activities and assignments because we also have a large population in tutoring.” They go on to explain that “we sometimes will like modify worksheets and then...the modified worksheets go to certain kids in Google Classroom and luckily they put that feature so that you can only assign it to certain kids.” P13 shared the same ability using Schoology, saying “they each get that individually on their Schoology, so that the, again, the whole class doesn’t see what everybody’s doing.” The learning management system allows for differentiation of classroom materials without all students being made aware that there are different versions of assignments or materials.

One challenge shared by participants was that they did not have a choice in the learning management system, which was instead chosen by each district. P1 shared their

frustrations with their district forcing them to rapidly change from one learning management system to another:

We started using Schoology the year that COVID happened and that was a huge learning curve for a lot of teachers because we were all used to Google Classroom. When we switched to Schoology...all of us were like 'I'm done. Done. Not doing any of this.'

The interface for each learning management system is different, which can lead to frustrations for teachers who are forced to change their practices, often with little warning, time to adjust, or training for the new system. The benefits and challenges that these learning management systems bring to both teachers and students will be discussed later.

Hardware. School districts have different financial resources depending on the funding received from state or federal governments and the property taxes that contribute to school funding, which can lead to differences in the hardware to which teachers and students have access. Participants listed the hardware available to them as Chromebooks (P2, P4, P9, P12), Smartboards (P2, P3, P6, P7), laptops (P10), iPads (P9, P13), headphones (P2), and a Nintendo Switch (P9) used for video game-based ELA assignments. There was no consistency between participants about the type or availability of hardware.

Monitoring Student Activity. While students are working on Chromebooks (P2, P4, P9, P12), iPads (P9, P13), or laptops (P10), participants found benefit in using the software designed to monitor students' screens. Teachers can use these programs to

remotely close browser windows, send messages to students' devices, and ensure that students are remaining focused and on-task during class time. For students with disabilities, participant 1 shared that "it helps with some of my ADD [attention deficit disorder] kids, like I can close tabs. I'm like 'oh, you're playing the game' -click- No more." One program mentioned by four of the participants was GoGuardian, and P12 explained: "well, a lot of my students have ADHD [attention deficit hyperactivity disorder], so it's easier to redirect them and keep them focused when I can control what they're doing on GoGuardian." P12 went on to say that:

It keeps them in check...I have a couple of students that cannot stay off of YouTube. Like they think that music helps them work, but it really doesn't because they're clicking back and forth...or they're watching TikTok reels. I can put up a scene that just blocks YouTube altogether and then I don't have to worry about it.

For students whose IEPs or accommodations specify that the teacher must provide redirection and refocusing in the classroom, participants indicated that programs such as these can be efficient and unobtrusive ways to redirect students' attention.

Schoology is another program that allows teachers to monitor the work being completed on students' screens, as explained by P13: "if we do a Google assignment through Schoology we can, in the writing or typing anything on an assignment, we can watch and follow along." P12 adds "that way I can monitor what they're doing and also help and look at the docs that they're working on, and that way I don't have to be reading

over their shoulder.” P7 said that they can “be watching students from afar, seeing how long they might be stuck on something.”

Other participants shared their experiences with being able to see and comment on students’ work on their devices. P7 explains that “we have access to students’ screens. So they can be working at their desks, right? And they can ask a question and it pops up on my screen as a chat.” P4 adds that in “Google Docs so you can go on it, which I like because that has a history of who typed what.” Participants’ experiences indicated that monitoring students’ progress remotely allowed them to hold students accountable for their contributions, communicate with students to offer feedback or assistance surreptitiously, and redirect off-task behaviors without calling attention to individual students in the class.

Instruction or practice activities. The tools used for instruction or practice activities included Blooket (P4, P6, P13), Castle Learning (P12, P13), crossword puzzle maker (P12), Delta Math (P13), the Desmos board and accompanying software (P1, P13), Discovery Education (P12), Edulastic (P2, P3), Eureka Math (P12), Google Suite (P3, P4, P6, P7, P8, P9, P12, P13), IXL (P6, P12), Kahoot (P4, P11, P12, P13), Kami (P3, P12), Khan Academy (P12), MonkeyType (P13), the Navigator system for use with graphing calculators (P11), Nearpod (P8), online sticky notes (P1), online textbooks from various publishers (P12), Peardeck (P1, P4, P9, P13), Quizziz (P13), StudySync (P12), Swank Media (P12), and the online game ‘What Remains of Edith Finch’ (P9).

Some of the tools listed were used specifically for review of concepts or vocabulary. P4, P6, and P13 shared their experiences with using Blooket, Kahoot, and

Quizziz to reinforce or review concepts or vocabulary in ways that boost student engagement. Kahoot is the oldest of the tools, having been released in 2013 for use with teachers and students online, and offers a game-based platform for students to answer teacher-created questions in a speed-based game environment (*About Kahoot! | Company History & Key Facts*, n.d.). Quizziz was founded in 2015 by two teachers offering remedial math instruction in India and offers a similar ability for teachers to create content-related questions and provide a game-based format (*About | Quizziz*, n.d.). Blooket is the newest game-based online platform used by participants, having been created and released in 2020 and offers the ability for teachers to create content-aligned question sets or to search for and use those created by other users (Blooket, 2024). P13 indicated that using game-based tools like these helps to keep students engaged in their learning. “Obviously the kids want to play games or Quizziz and Blooket, Kahoot, you know, so that’s helpful too.” P6 agreed, saying “we can use Kahoot and we just got approved to use Blooket. So definitely try to as well, especially when we’re doing like say vocab review. To do something that’s a little more interactive.”

P4 describes how they use the data gathered during a Blooket game to identify students who may be struggling with the content:

So Blooket, you can kind of see, like the game goes longer so you can kind of travel around and take like a mental notes of...I think the game’s like ‘Gold Rush.’ So who doesn’t have any gold? So...they’re missing all the questions.

However, teachers’ overuse of online games like these can have a downside, as indicated by P4, who said “you...come in the classroom, see Kahoot on the board and you were

like, excited. Now it's just kind of like 'oh' or some people hate them." This could indicate that overuse of an otherwise-engaging tool could have a negative effect on student engagement rather than the desired outcome.

Online ICT tools that were used for reinforcement of concepts and data collection on student learning include Castle Learning, Delta Math, Edulastic, Eureka Math, IXL, Nearpod, Peardeck, and StudySync. Participants shared how they assign work using the platforms, then collect and use student completion data to make decisions about accommodations and adjust instruction. They point out how the programs can help them identify which students are struggling with particular concepts and provide targeted reinforcement activities. P13 explained that "with math, just having the data available, you know, when they're done with quizzes...we can see Castle learning, it breaks down...which skill that we need to revisit." P3 shared their experience with Edulastic, saying that "I like the Edulastic because it gives them an opportunity to do like a practice test" and goes on to say that "it [Edulastic] would explain...why this answer was wrong and then give them another opportunity to redo the activity a lot of times." P12 described the benefits of using StudySync in the classroom: "We love how you can pick and choose which multiple choice questions you put in there. You can add writing...we love StudySync." The ability to gather and analyze evidence of individual students' learning is a powerful tool that can help teachers identify the types and degree of accommodations needed for students to adequately access the curriculum and demonstrate their learning.

Some of the ICT tools used allow teachers to push out the same document, assignment, or set of questions to students' devices at the same time and then monitor

students' work as they complete those tasks. The software that accompanies the Desmos electronic board has this functionality, and both P1 and P13 shared specific information about their experiences with Desmos. P1 explained that they have a Desmos board hanging in the classroom, but also have a connected handheld device "and I write on my desk and it shows up on the screen so that's super cool because then I can work through stuff with them." P13 shared how the Desmos program's ability to view student screens helps them provide timely feedback:

So Desmos is pretty cool because you can see the kids as they're doing their work. And the math class, to be able to see that is great because then right away we're like... 'Hey Susie, go back and check your sign' ...it's just immediate feedback right away. And also, you know, positive feedback... 'Sammy, you're done. Good job.' So that's good with Desmos.

P11 uses a TI-Navigator system attached to students' graphing calculators and wirelessly connects them to the school's network. They explain that the "Navigator hats that are connected wirelessly to our main computer, so we can actually push out questions onto the calculator. And then the students can answer the questions anonymously." Teachers can see which students answered the questions correctly or incorrectly, but that information is not shared with the students.

Kami is an instructional tool that can be used to share PDF files with students, and they can digitally annotate and submit their assignments. P13 explained that they use this tool in math class to "differentiate and type...notes and whatnot on their problem sets." Kami allows teachers to provide different levels of support for students by changing the

annotations on each document and sharing them with specific students. In this way, teachers can use the tools to make individual accommodations for students with disabilities without drawing attention to the students who require those accommodations.

Some ICT tools are used as digital collaborative spaces and allow students to interact with teachers or each other. P1 uses an online sticky note tool, P13 uses Jamboard, which is a digital whiteboard tool in Google Suite, P3 and P4 use Google Docs for student collaboration, and P6, P9, and P13 use Google Slides to promote student collaboration, monitor student learning, and provide ways for students to demonstrate their learning. P6 explains that by using Google Slides they're "trying to make sure that we're working on collaboration and having kids access each other and learn...instead of just to keep coming up and presenting." By moving the collaborative space online instead of relying solely on in-person conversations, students have the ability to extend their conversations and their learning beyond the walls of the classroom or the confines of class time.

Online instructional websites such as Discovery Education (P12), Khan Academy (P12), MonkeyType (P13) are used to provide access to content, offer opportunities for reinforcement of course material, and allow students to practice their typing skills. Participants chose tools based on the availability of the software and the needs of their students.

Assessment. Google Forms used for formative assessment data (P6, P12) and an unspecified program for online testing for math (P1) were mentioned as tools for assessing student learning. P6 explains that "I think electronically when you look at a

Google Form, it can sort it out much quicker for you, which helps, you know. It gives you your formative assessments very quickly.” P6 goes on to explain that in their class:

We do a lot of exit tickets. Or with their bell ringers where it’s just a Google check in. I’m so, like, times...Google Forms at the end just to be able to see where they are, you know? How much research did you get done today...?

Usually there’s some type of quick exit ticket and usually it’s in the form of a Google Form for response.

Google Forms also provide a vehicle for accommodations for individual student learning needs, as P12 explains, “...Google Form that we’re giving our special ed kids. We usually put the audio link in there...” They use teacher-recorded audio files embedded within Google Forms questions for students with disabilities who need to have tests read. P13 uses Castle learning for online assessments that can be used to inform instructional decisions, saying “just having the data available when they’re done with quizzes or so that we can see Castle Learning, it breaks down...which skills that we need to revisit.” P11 also shared that they use online assessments as “a really quick check in to see who was understanding this skill, who is struggling with this skill. What do we need to reteach here?” ICT tools can swiftly gather and analyze evidence of student learning so that teachers can make decisions about pacing, reinforcement, and the need to reteach certain concepts.

Accommodations for students with disabilities. For students who require accommodations to instruction to access the curriculum and learn alongside their neurotypical peers, ICT tools can provide those accommodations on demand. This frees

up the teacher to provide instruction to the whole class while still providing individualized support to students who need it. Many of the tools mentioned by the participants that provide this support are designed to help students who have disabilities in the areas of reading and writing.

Text-to-speech programs mentioned were Claro Read (P6, P7) or Dragonspeak (P1), Epic (P2), or unspecified text-to-speech programs (P2, P4, P8, P9, P10), or audiobooks available on Sora (P8, P12). P1, P2, P4, P6, and P10 discussed how they use these tools in class and how they benefit students. P1 mentioned a smart pen that scans text and reads it aloud:

We had a student who was missing a third of his brain and so he could function but writing was hard for him, reading was hard for him, following a line was hard for him, so he had this tool, I don't know what it's called. It's a pen, like it looks like a pen and he just highlights and it reads to him and he can go back. So that was amazing and then so that's moved on to another student.

P2 expressed that “a lot of them use a program called Epic for their reading. A lot of books on tape, just that type of thing. Our reading scores are very low and we're working to build that.” P1 explained how Dragonspeak is used for students with disabilities:

But then you have the other spectrum of the kids who hate to do anything on paper and like Bio for example...I've got kids who can't read and so they all have Dragonspeak or their Chromebooks will read it to them so they can put headphones in and they click read and it reads and highlights as they're going.

Using the speech-to-text program removes the barrier to learning presented by the student's disability and allows them to access and learn the course content alongside their peers and without the need for side-by-side teacher support.

Some students with disabilities receive testing accommodations where test items are read aloud, which presents difficulties when multiple students need this accommodation but may move at a different pace through the questions. P4 explains that "you can't talk to them all at the same time" and further explains that "there's times where there's seven or eight kids getting the tests read. They're not all staying. That's not a realistic expectation." P4 goes on to say that using ICT tools is:

Super convenient in terms of using accommodations, like if they need something read and we do tests read all the time...everyone's going to test at their own pace and trying to keep a room on pace, it's very difficult because the person who goes ahead, the person falls behind, it's like you're not going to keep them all together.

P2 shared a similar situation, saying:

Eduastic the teachers use for testing so that they have text to speech so that...me and the other couple of SpEd [special education] teachers aren't trying to read two or three tests at a time because we do pull outs for testing for all subjects and sometimes we may have a science, math, English, and history tests all going at the same time and it's impossible to read all of those tests – especially for the semester test.

Using the ICT tool to provide text-to-speech allows for appropriate accommodations at students' preferred pace in situations where one teacher would not be able to

individualize instruction to the degree needed to meet the needs of all the students in the class at the same time.

P6 explained that Claro Read was beneficial with their students, saying "...it's a program that will read anything that you pull up on your Chromebook, and it will read it to you." P10 mentioned that "...there's an app that we use that we like. We tag it in the internet and it will read whatever's on there to them out loud."

Speech-to-text features embedded within word processing programs (P1, P8, P9) or Co:writer (P9) can eliminate the need for a human scribe and provide a way for students with disabilities to demonstrate their content knowledge. P1 explains:

...our Chromebooks there's a talk-to-text feature and so she legit just talks right into her computer and it comes up and then she just has to edit it. It will read it back to her so that is huge. That's huge because she can verbally tell you – because she's listened – she can verbally tell you anything but she can't write it to save her life.

P2 agrees that they help students because "...they're not great spellers. They use dictation..." P4 shared:

Like anything over three sentences, anything over a paragraph they can type. So like not only have the option to type it, but talk to text is huge because there's so many kids who...need to speak before they type. I've had kids who have two documents open – one where they just talk into it and just explain their thoughts and others where they type into it.

P13 explained "...they can remember the content, they can say what the content is, but if they don't, they can't just read it themselves, or they can't write it down themselves. So that's where technology helps."

One participant shared their experiences during remote teaching and learning during the COVID-19 pandemic when in-person instruction was paused and classes were held on video conferences rather than in-person in classrooms. P7 shared:

I have to say that was one of the nice things with COVID...being a special ed teacher that we could, during a meeting...go into a room with the kid or put kids in different rooms and fly around the different rooms and nobody knew who was getting that extra help or content retaught to them or explained.

Creating breakout rooms within the video conference session allowed this participant to differentiate their instruction and provide reinforcement and accommodations for students who needed them, without revealing to the rest of the class who was receiving these services.

Additional tools described by participants are NewsELA, which is a website that can adjust the reading level of content-related text to make content accessible at a students' reading level (P10) or Grammarly to help students identify mistakes with spelling or grammar (P9). These tools allow students to demonstrate their understanding of the course content by utilizing ICT tools to reduce or remove some of the challenges that their learning disabilities may present.

Differentiation of Instruction. Further modification of lesson materials or classroom activities are made possible by using ICT tools to adjust the complexity of

language on reading materials (P9, P12) and provide reinforcement or extension activities for students who need them (P4, P7, P13).

To modify reading passages for their students, P9 said “with all the new AI stuff I can go in and take the reading passages and level them.” P12 also modifies instructional materials for some students, and uses Google Classroom, saying “...we sometimes will like modify worksheets and then...the modified worksheets go to certain kids in Google Classroom and luckily they put that feature so you can only assign it to certain kids.” P13 shared a similar experience, explaining that “some kids only have to do two paragraphs and some kids only have to do one paragraph, so they each get that individually on their Schoology, so that the whole class doesn’t see what everybody’s doing.”

Teachers who can access lessons and materials ahead of time can pre-teach some of the content or vocabulary to students with disabilities who may need additional rehearsal of the information to successfully understand and retain the content. P12 shared:

It’s nice to be able to pull up whatever I can pre-teach, so say we’re doing something in social studies. I have them fifth bell, social studies is sixth bell. So if we’re doing something where it’s going to be a lot of reading and it’s going to be over their heads...I’ll go in, pull it up, and then we’ll annotate together. We’ll pre-teach the vocabulary.

They go on to say that “exposing them to it prior to actually doing it does make a big difference.”

Inclusive classrooms contain students without disabilities who can often move at a quicker pace through the course materials than students with disabilities who may need additional time and support to successfully complete the same tasks. P4 explained that they use ICT tools to encourage students to explore, saying “how can we use that extra 10 minutes that they’re going to find because they finished first and...we like to do current events, science stuff.” Allowing students to research and learn about topics that interest them after they have completed the required tasks leverages technology to promote learning and the wise use of time resources in class while meeting the needs of all students in the room.

Making Content Accessible. Many secondary students with disabilities struggle with the reading level of the instructional materials used in their classes. P2, P8, P9, P12 and P13 contributed their thoughts about how ICT tools help students with disabilities access content information more easily. P2 shared that “I think it really kind of helps them understand the content and maybe not limit them so much on their reading ability,” adding “I do know that it does increase their knowledge. It increases their ability to gain knowledge.” P9 explained that using a text-to-speech program with their students

...gives them the ability to access the curriculum on their level. You know, like some of them, they just can’t read but they can understand it fine, so it gives them the ability to have the same access and it’s not disruptive of me going over and reading to them over their ear. They can plug in their earbuds and it’s fine.

P9 said that using ICT tools “helps them access the curriculum a little bit easier.” P8 agreed, saying “if they use it appropriately, hopefully it helps them feel independent and

helps them access and do the assignment.” P13 concurred, adding “technology just levels the playing field much faster than it used to.” The participants found that giving students access to ICT tools assisted them in their learning journeys and helped them to be more independent and more successful in accessing the course content in the general education classroom.

In addition to students with learning disabilities, providing support for students who are newcomers to the United States and for whom English is not a primary language can be challenging for teachers. P10 and their co-teacher use Canvas “...mostly because there’s a translate button. And they can translate the documents into their native language.” P6 mentioned the use of Google Translate for the same purpose. For English language learners in classrooms without language support, using ICT translation tools allows them to access the course content in their native language and learn alongside their peers.

Demonstration of Learning. ICT tools have been implemented to help students learn the content and can also be employed to help students demonstrate their level of knowledge, as explained by participants P2 and P9. P2 stated that “I think it really helps them understand the content and maybe not limit them so much on just their reading ability, but more on...actually their knowledge base instead of just their limited reading skills.” P9 explained “so ultimately, that’s the whole point of it. I mean, the ones who talk into the computer to write their essay, that’s just allowing them to still write their essay and show what they know without somebody like sitting next to them and doing it for them.” P9 added that “this is giving them more independence and freedom to do it on

their own.” Students with disabilities in participants’ classrooms can use ICT tools not only to access curriculum at a reading level that is appropriate for their individual learning needs but can also use that same technology to demonstrate a level of understanding that might not be possible without these tools.

Sharing Materials or Content. Rather than relying on paper copies of instructional materials, teachers use ICT tools to share electronic copies of notes, lesson materials, and assignments with students. The programs listed were Canva (P6, P9, P12), Canvas (P7, P10), Google Sites (P6), Google Suite (P6, P7, P8), Libby to share audiobooks (P13), and Microsoft Suite (P10). P4 states that it’s “easier to share documents, share notes.” P11 feels similarly, stating that “everybody gets a copy of class notes electronically, and then our students with ‘copy of class notes’ on their IEPs – they also get the paper copy to supplement.” P11 goes on to explain how they use Google Classroom to share different types of resources:

But everybody has it in Google Classroom to access if needed, especially if they are absent. And we also post everyday lesson videos, so every day we teach the lesson, we then post the video for that lesson on Google Classroom as well. So it’s kind of more of a resources – shareable network than where we actually collect assignment information.

Using the electronic storage tools to send copies of assignments and materials also benefits students who are absent from school. P1 shares:

If they’re absent they know they can just check the Schoology classroom – the teachers post everything on there...unfortunately kids get suspended for an

extended period of time and now they have access to their work...and they have access to the teachers.

They go on to explain that “special ed-wise, that does a lot with them still getting access to services, like our school has a Zoom thing and we can Zoom with kids when they’re suspended to do homework.” Having an electronic repository of materials, the ability to share documents and resources, and meet with students extends the learning opportunities beyond the walls of the classroom and makes provision for students’ circumstances or choices that may interfere with the continuity of their learning.

Organizational Support. Students with disabilities frequently need support with maintaining a system of organization for school-related papers, notes, and assignments. Processing delays, executive function disorders, and attention deficit disorder can be additional challenges for students with learning disabilities. For secondary students and their teachers, students’ lack of organizational skills and misplacing of needed materials can be frustrating and present additional barriers to learning. Some participants shared their experiences using ICT tools for organizational support. P4 stated that using ICT tools and having electronic copies of materials “helps make students more organized because you’re not losing the paper.” P9 concurred, saying “so they have paper copies but they also have a digital copy because they lose everything anyway, so it’s all there.” P13 said that “the amount of paper chasing and locker cleaning is so much less when we’re using technology.” They added “and how about when the kid loses the paper, then they have to redo the whole thing.” P8, when speaking about students’ lost papers, explained that ICT tools allow them to locate digital copies of students’ work, saying “we

can just go in and search your drive and there it is. We just search up the document name and find it.”

P6 related how they use a teacher-created Google site “which is a really neat way to be able to kind of keep your lessons and everything in one spot” and goes on to explain how they and their co-teacher use their learning management system to organize classroom materials for students:

And so everything she does is on there...kids can see what the agenda is, what the learning targets are, what we’re doing, and so that’s great for the kids with special needs of any sort of kids that have issues of just going ‘OK, where are we?’

Having electronic copies of materials stored on a student-accessible platform can help students stay organized, reduce frustration for both students and teachers, and prevent students from having to redo work that they have misplaced.

Benefits for Using ICT Tools. Participants shared their experiences with using ICT tools in their inclusive classrooms and provided stories of how using those tools have benefitted both students and teachers.

Benefits for students. A theme that emerged from participants’ responses was the benefit that ICT tools provided for students with disabilities in inclusive classes. While all participants shared ways that ICT tools benefit them and their students, P4, P6, P7, P9, P10, P11, and P13 contributed specific thoughts about the benefits for their students when using ICT tools in their classrooms to provide feedback on students’ work.

Students with disabilities require accommodations to the curriculum or resources to support their learning, but at the secondary level, students can be reluctant to call

attention to themselves or their individual learning needs. P7 explains that when using ICT tools “sometimes you can nonchalantly and not make it obvious, communicate with kids and help kids.” They also shared:

...because some kids are kind of more shy and embarrassed and don't want somebody standing right next to them in class or pulling a chair up to their desk...kids will share stuff with me, especially like if they've got an English paper to write or something. They're often sharing their docs with me just so I could help them get live on the spot feedback to them.

P13 explained that the ability to comment on students' work using ICT tools “especially for special ed students, it's silent feedback” and went on to share the benefit that “the whole class doesn't see what everybody's doing.” P11 shared that they use their board to display students' answers, but “when we showcase it on the board, it is anonymous so that way students don't feel embarrassed. Part of our social-emotional learning, so we just show like rough data.” P7 added that “it's a tool that we are able to use right on the spot to be able to check in with kids or provide assistance in the classroom. Right on the spot for kids.” Sharing feedback with students isn't limited to a single classroom, as P4 explains that “if they're in a different room, that teacher can just pull it [the document] up too, because it's right on the computer.”

Secondary students frequently follow different sleep patterns than younger students, sometimes working on schoolwork late into the night, when teachers are not available to provide feedback and assistance. ICT tools can support them when they are working, as P7 explains:

Like there might be the night owl working last night on an assignment and they'll leave a comment or leave something for me and then I'll see it first thing when I get there. So it can be times that I don't even necessarily see the student that day, that I'm able to communicate with them and give them authentic feedback on their work versus them waiting to see me after school.

Even during the school day, students may need assistance from a teacher during a time when they don't have access to that teacher. P7 shared that the ICT tools allow students flexibility in communication, saying "...they can leave messages, submit things, get feedback and it's not waiting until it's due and then turning it in. They can get...help along the way if they need it." They also added "I feel like it's helped a lot of students to be a lot more proactive in getting assistance with their work." They continued to say that the assistance is available "at their whim, when they're ready, when they need the help." A common theme shared by the participants is that ICT tools provide flexibility with the timing of communication and feedback and the ability for students to receive reinforcement, reteaching, accommodations, and modified instruction without their peers knowing they are in need of additional support.

Student Engagement. High school students can struggle with motivation, and for students with disabilities, those struggles have the additional challenges of the barriers presented by learning disabilities. Participants shared their experiences using ICT tools to boost student engagement and keep them invested in their learning.

P4 explains that "you can look at their answers in the moment. You can keep their answers, create discussions...there's so many more options for engagement." P6 shared

how they use interactive games to reinforce content “especially when we’re doing vocab review. To do something that’s a little more interactive.” P1 said that ICT tools has helped some of their students because “you have the other spectrum of the kids who hate to do anything on paper” but will complete and submit work electronically. P8 shared a story about one of their students who is accessing an ELA text using an audiobook, saying “he’s actually very enthusiastic about the book and he’s participating in class discussions, which isn’t something that he’s done quite as much in the past.” Incorporating ICT tools into instruction has benefitted some of the students in participants’ classes and has increased their engagement with class activities.

An interesting and unique approach to incorporating ICT tools was shared by P9, who teaches a video game-based ELA course. They explained that “you still have to get through the stuff...but with the benefit of playing a video game – that’s your ticket to do the work. You know, that’s your incentive carrot dangle.” They shared that the format of the course teaches students about the ELA course content through game-based instruction, where students have assignments and tasks centered around specific games. One example is the game “What Remains of Edith Finch” where the player is the last living member of a family who explores her family home and learns about the lives and deaths of each family member. P9 shares that it’s “a computer-based game but it’s learning about death and there’s a lot of social emotional video game type of stuff.” Students are more engaged with the game-based format of the course and are more successful at learning and demonstrating their understanding of ELA content than they were in previous traditional ELA courses, according to the participant.

A response from P7 provides a good summary of the increase in student engagement from using ICT tools: “I feel like the kids are way more technically advanced than I am and know way more than me, but I feel like we’re catching up and we’re learning because I feel like that’s what works with students.”

Benefits for Teachers. ICT tools can provide time-saving, convenient ways for teachers to gather data, interact with students, share materials with colleagues, hold students accountable for their learning, and gather evidence of learning for reviews of accommodations for students with disabilities. P4 uses ICT tools to gather data about students’ learning, stating that with “Peardeck you can see the responses and then you can attach it to the name.” They added that “that’s why I like Peardeck...you get examples for IEPs.” P11 stated “we can pull all the evidence and data and show it up on the screen” and added that “we as teachers can go back and see which individual students answer.” P12 enjoys having access to shared materials with their co-teacher, saying “it’s nice to be able to pull up whatever I can pre-teach.”

Incorporating ICT tools into classroom instruction has benefits for both students and teachers, according to P9, who shared the ways that instruction has been improved. “The technology is so advanced. It’s so much nicer nowadays to do the things for the kids and it’s not invasive. I don’t have to wheel big carts down the hallway...we have the smart TV’s so I don’t have to have overhead projectors.” Less equipment and physical materials need to be moved, maintained, and set up in classrooms, which this participant appreciated.

P12 praised the convenience of having access to students' accommodations, saying "I think technology has definitely made things easier and like being able to just pull up like IEP Direct or FBA [Functional Behavior Assessment] online...it's easy." They added the convenience for their co-teachers as well, saying "my co-teachers can pull up the IEPs on SchoolTool if they really need to." A requirement for general education teachers in some school districts is to sign students' IEPs to acknowledge receipt of the students' accommodations, with the special education teachers held responsible for ensuring that general education teachers provide a signature. P12 explained how their district shifted to electronic signatures for IEPs: "We did them in SchoolTool, which was awesome as well...way easier and less time consuming."

Incorporating New ICT Tools. The speed with which new ICT tools are developed and released often outpaces the amount of time that participants have to explore the tools, gain proficiency in their use, and determine how best to deploy them or integrate them into existing lesson materials, according to participants. In the process of incorporating new ICT tools, participants shared the amount of input they had in the choice of tools used, the effort needed to integrate them into instructional practices, and their knowledge of the district approval process needed to start using new ICT tools.

Input on ICT Tools. Decisions about new ICT tools are made at the district level, the building level, and the classroom level. Participants' experiences differed in the degree of influence they have over the specific tools chosen and implemented by the district and within their co-taught classrooms.

At the district, building, or department level, some participants (P1, P12, P13) reported that they had little to no input. P1 shared “I don’t have a whole lot of say, like I know what we’ve used for math and I don’t really know what there is now for science.” They go on to explain their frustration with the district’s decision-making process being in the hands of the principal and the technology department, saying:

The principal blames the tech person, the tech person blames the superintendent, and the superintendent puts it back on the principal so we don’t really ultimately know...it’s not very individualized, it’s kind of like all or nothing.

P11 agreed, saying “the district has already established: you have to use Google Classroom, you have to do Delta Math. You have to have a calculator.” P13 also mentioned that the district chose the learning management system, explaining “in terms of Schoology, the big one, zero choice because that’s what the school chose.”

Some participants (P2, P4, P9, P11) shared that they can suggest new ICT tools to their academic departments or to their school districts. While they didn’t always receive access to the tools they suggested, they felt comfortable bringing new ideas to their district for consideration. P9 explained that “I just have to talk to our district tech and tell them that I need to do this. Some of the apps and stuff, they’re usually pretty good about letting me do stuff.” When asked about whether or not they would feel comfortable suggesting new ICT tools to their districts or their co-teachers, P4 responded “absolutely. You would have no problem with that.” P11 shared that “if there’s anything that I want to do, they’ll totally take my suggestions as well.” They continued by explaining that though the district had chosen the learning management system and some of the

platforms used in their school, they did have the ability to suggest content-specific tools, “so really our autonomy to choose our individual things we do – I go to the department and they’re very understanding, but really that’s the only thing they have the opportunity to choose.” P2 also felt comfortable suggesting tools, saying “we have the ability to suggest. We don’t always get what we want but our SpEd [special education] director’s pretty open.” These participants understood that there might have been financial or administrative constraints that prevented the district from granting access to some tools, but they felt comfortable enough to approach their departments or district leadership to ask for access.

There was a lack of consensus about the input on the ICT tools used in the participants’ inclusive classrooms. For some participants who worked with more than one general education co-teacher, the level of input depended on the specific general education teacher. P1 put it succinctly by saying “it depends on the teacher, honestly” and explaining that “...it’s just knowing when and where and who to kind of try to put that stuff in.” P3 and P10 shared similar sentiments about the level of input being dependent on the personality of their co-teachers. The amount of input for other participants ranged from the general education teacher not being open to suggestions and makes all ICT decisions to a moderate level of suggestion to some who were very open to suggestions.

Participants P1, P3, P6, and P10 work with general education co-teachers who are not open to suggestions and who make all ICT decisions. P1 explains that “within the classroom it’s pretty much just whatever the teacher uses, what they decide to use” and continues with “I don’t have a whole lot of say.” They go on to state that “most of the

time it's their classroom and I'm kind of like in it." P3 is in a similar situation and explains "I did not get any choice in what they do in either one of the classrooms...that's the gen ed. They don't give us any. I wish they did." P6 and P10 work with teachers who prefer non-digital methods for completing work. P6 explains that one of their co-teachers "is just kind of really set in his ways and everything's very paper-pencil and we've used the same thing for a very long time." P10 said the same for one of their co-teachers, saying that "my global guy, he...he does what he's going to do. I can suggest things all day. He's still gonna go back to what he does." These participants were reluctant to offer suggestions to their co-teachers about new ICT tools and assumed more of a support role in those teaching spaces.

Some participants indicated that their co-teacher is moderately open to suggestions for incorporating new ICT tools, and

Now if I come up with something individual for one of my students that I think is going to work great, we have an awesome staff, like if I went and said 'hey *** I've got this thing I really want to try with this kid – you know they have problems with A, and this will do this for them but we're going to have a learning curve.' 99.9% of my staff is 100% on board...like 50% of the teachers that I work with would be like 'oh yeah let's do it! Let's try it' but you know we're all set in our ways and we don't like change.

When asked how much input they have on the types of ICT tools used, P1 responded that it "depends on the teacher, honestly...there are a couple of teachers that I work really really well with and I can be like 'hey – I found this thing – let's try it' and

we would just pick a class that I'm in and she would try it with me." P10 responded that "because I'm comfortable with both of my co-teachers I can just talk to them. But I have had people that I don't work well with in the past and I've had people that don't always understand special Ed needs." They went on to explain that suggestions aren't needed with one of their current co-teachers because they "would have already built it in – I don't even need to."

P6 explains that they have input, but that their input does have limits, saying "I can come and say hey I think this would be a good idea. I found this, but as far as making the ultimate decision, it really falls on the master teacher, at least in our type of role." They continue, saying "I wouldn't feel like I could come in and implement something with at least not having the conversation and making sure the teacher's on board...but the teachers I work with are...both very tech savvy and are happy to find new things and new ways."

Some of the participants were very happy with the level of input they have on the choices of ICT tools in their classrooms and reported that they work with co-teachers who are very open to suggestions for implementing new tools (P4, P6, P7, P8, P9, P10, and P12). P7 reported that "the teachers give me as much freedom and flexibility as I want, like it definitely is a shared role." They related an experience sharing a suggestion with their co-teacher, saying "I think he is super open to ideas that I bring to the table and he has taken some of those and he's like 'oh my gosh, I love this! We're using this!'"

One participant in particular seemed to have the most autonomy and largest role in decision-making on ICT tools with their co-teacher. P9 explained, when asked about

the level of input they have on the choice of ICT tools, “Oh, I get to do whatever I want.” They reported that with one of their co-teachers “she’s open to anything that I...whatever I come up with and what is fair for one we let everybody use.” She went on to say that this co-teacher “is willing to try new things if I have a great idea or I want to use something different.” When asked about which of them made the initial suggestion for implementing the ICT tool, P9 responded “usually me because I’m always thinking outside the box of the normal.” This participant’s experience with their co-teacher stood out as the most equitable in the shared decision-making process, especially concerning ICT tools. A determining factor for the level of input the special education teachers have in the ability to suggest and implement new ICT tools seems to be the relationship with their co-teaching partner. This idea will be discussed in more detail in the section on Social Influence later in this chapter.

Effort Expectancy

Effort expectancy addresses the “degree of ease associated with the use of the system” (Venkatesh et al., 2003, p. 450). In the context of this study, effort expectancy refers to participants’ perceptions of how easy or difficult the ICT tools are to use and implement and the role that ease of use played in their decisions about whether or not to implement specific tools. This will also discuss the ICT tools that participants have stopped using and the reasons for discontinuing their use. While analyzing participants’ responses, I discovered that effort expectancy was closely tied to the time, training, and professional development provided by participants’ school districts, though the insights

gleaned from these facilitating conditions will be discussed in more detail in the section on facilitating conditions later in this chapter.

Participants' experiences concerning the ease of use for ICT tools can be divided into three main categories: those that are easy right away, those that have a learning curve for either teachers or students, and situations where the difficulties resulted from a district's decision to implement an ICT tool.

The tools that are reported by participants to be user-friendly and easy to incorporate were the text to speech programs (P2), Google Docs (P4, P8), Blookey (P4), Peardeck (P4), Hapara (P8), Nearpod (P8), Google Slides (P9), Cloud Audio Recorder (P12), and the TI Navigator system (P11). P8 shared how their co-teacher made the suggestion to use Hapara: "so he said well let's try this Hapara thing and see how it works. And for us it's been really easy, like you can literally take a document and just drop it into their drive and it's there." They also explained how they used Nearpod during the shift to remote learning during the COVID-19 pandemic, saying: "for the students I was working with, they understood how it worked so I didn't have to teach them how to use it." P8 shared their love for the feature in Google Docs that allows students to easily create a works cited page: "it's really user-friendly. Google will just look up the link and pull out the author's name and the date of access and all that stuff...it's really really easy to have it create your works cited list just within the document." P12 shared the ease of use of Cloud Audio Recorder, saying "...Cloud Audio is super easy. That's like: Record - and done." These tools were used frequently in those participants' classrooms by both students and teachers in part because of the ease of use.

The tools that participants felt had a learning curve were Schoology, (P1), the Smart boards (P2), Kami (P3, P12), Eureka Math (P12), Canvas (P7), Easy Interactive Tools (P12), Canva (P12), and Screencastify (P12). Having a learning curve wasn't a deterrent if the participants believed that the performance expectancy was high enough and the program would benefit their students, though they expressed some frustration when first using the ICT tool.

Concerns with the ease of use of Schoology expressed by P1 seemed to stem from participants being forced to change learning management platforms without what they felt was adequate time to learn how to use the platform themselves. They explained that "I think just one it was new. Two, everybody was used to Google Classroom and they didn't really give us an option." Rapid changes to learning management platforms can frustrate both teachers and students as they adapt their practices and materials to the new platform. If this shift is not accompanied by additional time and training, it can increase the stress for teachers and decrease their willingness to use and implement the software. P1 explained that after their district made this shift, they and other teachers in their building expressed their frustration, saying "I'm done. Done. Not doing any of this." While this shift was a requirement from their district and they did have to implement it, the lack of support made it an unwilling and uncomfortable process.

P12 provided quite a bit of feedback about the tools they use and the difficulties they experienced while implementing them. They gave a lukewarm review of Kami, saying "I have used Kami – that works too. I feel like it's less user-friendly, though I don't love it as much. But it's okay." Their experiences with Screencastify were similar:

ScreenCastify – there’s a lot. There’s a lot you can do with it. So we feel like there was a learning curve there. That one definitely took a lot longer to get used to and figure out what works. Like do you want yourself in the bottom corner when you’re reading something? Probably not, but then are they going to lose you with the audio signal also? That then all of that when you go into edit. If you do multiple takes, that took a while. And then if you want to add text, I mean it’s user-friendly, you could figure it out, but it does take a little while when you’re not given the tutorial video.

P12 mentioned the difficulties students had with using Eureka Math in class, saying “that’s not super user-friendly and the kids get very overwhelmed by it.”

It was interesting to hear from participants that they were willing to invest the time and effort needed to become proficient with some of the more challenging-to-use tools because they believed those tools would benefit their students. P11 shared how they implemented the TI Navigator program, saying that it’s a bit more labor-intensive for teachers:

Because we have the calculator software on the computer, so we have to put our computers in test mode. And then we have to block out which questions we want to use, so really the bulk of the difficulty is on the teacher to use the calculator.

They go on to explain that teachers have students practice using the software during the first week of school: “we have them practice with just generic questions...and we show them how we pull the data. We do all that, but then it becomes super easy.” In this case,

the effort needed to gain proficiency with the software was acceptable for the potential benefit for students.

Facilitating Conditions

Facilitating conditions are the “degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system” (Venkatesh et al., 2003, p. 453). For teachers who wish to incorporate new ICT tools into their instructional practices, the facilitating conditions include the district’s approval process for adopting new ICT tools, the time granted for teachers to gain proficiency in the use of new ICT tools, instructional coaches or other district staff responsible for supporting teachers in implementing ICT tools, and professional development or training provided by the district for ICT tool use and implementation into classroom practices.

District Approval Process

Participants’ experiences with their districts’ approval processes ranged from some understanding of the process (P2, P3, P4, P8, P9, P10) to a solid grasp of the steps needed to gain approval to implement new ICT tools (P6, P7, P11, P12, P13). Knowledge of the process, however, didn’t always lead to approval of new ICT tools.

When asked if their district has a plan in place for approval of new ICT tools, some participants (P2, P3, P4, P8, P9, P10) expressed that they know that a process exists and have some familiarity with how to gain approval for new tools. P8 responded that “I think I would know what the process would be if it were for special ed.” Associated costs can impact approval, as P2 shared ‘if it’s free, we can probably use it without any problems...if it’s not free, then we have to go through a few more hoops and get it

approved through our administration and see if there's funding..." P9 had a similar experience with funding impacting approval, sharing that "depending on the cost, sometimes I can go into the special ed route and talk to the special ed director and see if there's money in the budget because we need this...for a specific student for a specific need." P4 explained that they have a classroom budget that can include subscriptions for ICT tools, but if new tools are found mid-year, they said "I believe you just go to your administrator and run it by them and then they would just make that decision like it that's an immediate need or if that's a we'll put it on your list at the end of the year". P9 concurred that the timing of the request could impact the approval process, sharing "I would have to probably write up my reasoning for needing it. I would have to do it at a certain time in the budget to be approved."

Other participants (P6, P7, P11, P12, P13) explained in detail the approval processes that exist in their districts. P7 shared:

Yes, there is a form that we have to fill out and then it has to go through the IT department and there's an IT committee and they have to look at it, investigate, check if it's Ed Law 2D appropriate and go through all of those steps than then it can get on the approved list...it doesn't happen overnight or as fast as we'd like it to, but they are willing to explore and look into new options for us.

The educational law mentioned by the participant is a New York State law that prevents third-party contractors from gathering or releasing personally identifiable information, which has impacted the use of software programs and applications in public schools in New York State (*NYS Open Legislation* | *NYSenate.Gov*, 2015). Both P12 and P13

explained that they have a technology director or specialist in their districts who is the first step in the approval process and then passes their request to the building principal or district technology committee for final approval. The participants in the group who have more familiarity with the district approval process also shared more ICT tools used in their classrooms than the group with less understanding with their district's approval process.

Even in districts where the approval process is well-publicized and teachers understand the steps needed to gain approval to implement a new ICT tool, participants understood that their requests wouldn't automatically be honored. P10 shared that "we can request things, but that doesn't mean we're going to get them." P2 agreed, saying "...we have the ability to suggest. We don't always get what we want..." Funding is a concern, as shared by P12, who explained that approval "...depends if it needs a license for each student they're more likely to say no." The complexity of the approval process can also be a barrier to implementing new tools, as P10 explained:

We're just such a big district that we have 4 high schools. So I have to go through our assistive tech guy and I would sit with him. We would do an assistive tech evaluation and then depending on what it was that was required, I would have to go through our Chief Executive Officer or HR to see what money and then we're have to apply through special ed and it's just a lot. So we tend to rely on whatever we have in the district, right?

As new ICT tools are developed and released, it is likely that teachers will encounter platforms or programs that may provide significant benefit for students with

disabilities. According to the experiences of the participants, districts who allow teachers to offer suggestions about new ICT tools to implement and publicize the procedures needed for obtaining approval for the use of those tools could have higher incidence of ICT tool use for students with disabilities. This could assist teachers in making accommodations and modifications to the curriculum and increase accessibility for students with disabilities.

Time for Implementation

The participants' experiences differed in the amount of time they were given to learn about how to use the ICT tools and gain proficiency with them before implementing them in their classrooms. Five of the participants (P7, P8, P9, P11, P13) shared that their districts do provide time and training for them to learn how to use the ICT tools, while four (P1, P2, P3, P12) shared that they are not provided with adequate time to learn how to use the ICT tools.

In the group that reported that they were given time for learning and practice with the ICT tools, P11, who was granted time to use the tools alongside their co-teaching partner, shared that "you can have the hours. Yes, you have time to work together." P9 also reported that they were allowed to attend training sessions on ICT tools with their co-teacher. P7 shared their experiences with attending professional development on how to implement the ICT tools, saying:

I feel like it was a bit of a learning curve...I soaked up every bit of PD that I could just to make sure what I was doing was working, because otherwise that could become very frustrating for students.

They went on to explain that their district will “allow different departments to host their own PD on those [conference] days. It can be technology related or not.” Both P11 and P13 shared that their districts allow them to sign up for and complete multiple professional development or training sessions, granting them both the time and funds to cover the costs associated with the training. The time provided by the district to learn the tools doesn’t seem to correlate with the incidence of use, as P11 reported using four different ICT tools in their classroom, P7 noted five tools, P8 reported using six tools, P9 reported using 12, and P13 mentioned 14 different ICT tools.

Teachers who reported that they do not have adequate time to learn about the ICT tools before implementation (P1, P2, P3, P12) explained that the lack of time for practice impacted their ability to gain proficiency and comfort with the tools and therefore led to less ICT tool use in their classrooms. P1 shared that their district will introduce new ICT tools “oh hey – here’s this new thing! It’s so great! It can do ABCDEFG! But we don’t get any time to play with it to try to make it work for what we want it to.” They go on to say that “I don’t know if there’s not time or they don’t trust us...maybe they can’t count it for PD if they’re like hey get together and go talk about PearDeck for an hour.” P1 did share that their district does have a technology coach who holds a “Coach’s Corner” on Fridays but says that “beyond that there’s not any time to just hey – how did it work?” P2 explained that they have a similar situation in their district, with the time provided for ICT learning being “just like minutes stuff at the beginning of the school year, or what we can get at the co-op on our own. And that’s pretty much it.” Both P3 and P12 reported that their districts selected only some teachers to attend training on specific ICT tools,

leaving the others to teach themselves how to use and implement the tools. P3 related their experience with the district-provided training on using the SmartBoards, saying “supposedly they had a SmartBoard training, but I guess that maybe it was an update and only certain people got to go to it.” P12 related a similar situation, saying “they only allow a few people to go to them, so when I first started they had me go to a GoGuardian training.” Interestingly, the reported lack of time provided for teachers to gain proficiency in the use of the ICT tools does not seem to have any correlation to the number of tools used in their classrooms. P3 reported using four different ICT tools in class, P2 noted seven different tools, P1 mentioned 13, and P12 reported using 22 different ICT tools as part of their classroom instruction.

Instructional Coaches or Support Personnel

Some of the participants’ school districts have created a position of a technology integration specialist or instructional coach to support teachers in ICT tool integration. Not all participants had experiences to share with district personnel who were tasked with ICT support, but for those who contributed experiences, the levels of support seen were little to none, sporadic support, or a great deal of support.

The participant who shared that they don’t have a staff member for ICT support was P8, who said “I don’t think we have a tech integrationist type person. And I was thinking when was the last time we had a PD like that? And I think it was the beginning of the year.” A bit later in the interview, they explained that their district used to have a technology staff person but no longer does, saying “we used to...we’ve got math and

literacy coaches in the building who might know some things.” P8 also shared very little about the ICT tools used in their classroom.

The participants who reported sporadic support for ICT tool integration were P1, P2, and P13. P1 explained that their district has “educational coaches that will come in and be like: OK – we get 10 minutes...you guys know this about PearDeck? Do you know that you can do ABC and D?” P2 shared that they do have a technology support person, but that they “started doing videos that we could watch, but then he is our only tech guy and he is pulled across three campuses and so it kind of fell by the wayside. Good intention, just didn’t have good follow through.” P13 communicated that they do have a “technology person. He used to work for BOCES [Boards of Cooperative Educational Services]...now our district just pays him to work for us.”

Participants 10 and 11 both described a level of technology support that exceeded that of the other participants. P10 explained that “if I don’t know how to use something, there’s somebody I can always ask. And they will show me how and that’s never been lacking in our building.” P11 noted that their district has a dedicated technology learning coach to support ICT implementation and use. They explained that their district learning coaches “will usually learn the app along with us and then if we have questions, they kind of become the person who is a specialist in it...” They continue by saying that their building also has a library media specialist who provides support for teachers. “She will often learn the apps as well...and if we have issues, she’s very big into the technology piece of it.” P11 continued to describe the support, saying that when she has asked for help from the library media specialist, “she will come over, she will observe, she will

come work with you, she will find PD, books, whatever you need to support you. So you do have on-demand support.” This level of personalized support was unusual as compared with the experiences for the other participants and it is interesting to note that P11 only provided the names of four ICT tools used in their classroom. This increased level of access to support does not seem to have encouraged this participant to incorporate additional ICT tools into their instructional practice.

The availability of a technology support person employed by the school district does not appear to have an effect on the number or types of ICT tools implemented in these participants’ classrooms.

District-provided Professional Development or Training

Participants had differing opinions on the availability or usefulness of the district-provided professional development for ICT tools. A few participants (P1, P3, P12) cited schedule conflicts with other required training sessions as barriers to attending professional development or training sessions that were boring or not helpful (P12). Teachers also had either positive (P4, P7, P12) or negative (P1, P2, P12) attitudes about the district-provided training.

Of the participants who expressed their frustration with scheduling conflicts as the reason for not being able to attend professional development, P1 was the most vocal about their experiences. They explained:

A lot of the time the PD – they’re like hey science people go over here and do this but we don’t to do the content stuff because we got Special Ed stuff we gotta talk about like we’ve got federal paperwork like hey this change is happening. I’m like

but I really want to be over there and so that's kind of hard too because again we're pulled in 17 different directions.

They go on to say that "a lot of it's like here you go, here you go now go have fun and use it and we don't have a whole lot of opportunity to...I tried this – it didn't work."

P12 shared their opinion about the content of the training, explaining that their district required all teachers to attend a training for the Branching Minds platform when only the teachers providing academic intervention services were planning to use it. They described their experience, saying "...we all had to take training on Branching Minds over the summer and it was awful...Was really really bad. It was two hours long and it was just somebody droning on and on." For both participants, their district did make professional development available, but the unengaging training or unequal access for all teachers contributed to negative attitudes about those ICT tools.

Conversely, some of the participants (P4, P7, P10, P11) had positive things to say about their experiences with district-provided professional development on ICT tools. P10's comments clearly express this: "Listen, I will not mock my district on the amount of PD that they offer. They offer a ton! There's summer PD that you can get paid for as well." They continue with their opinion about the amount of support available by saying "If I don't know how to use something, there's somebody I can always ask...that's never been lacking in our building. So I'm gonna give them kudos for that." Similarly, P7 reported that their district "tries to be super supportive of technology." They spoke positively about the training opportunities provided for them, saying "I feel like our district is trying to keep up with what's out there and what it's offering for us to be able

to utilize.” They go on to praise their district for offering different professional development for the proficiency levels of different teachers. They explain: “...we don’t all sit in the same PD depending on what level we’re at, which I think is nice because we used to never do that – we used to all get the same.” The content in each training session

P11 expressed positive feelings about how inclusive their district was when offering opportunities for training and how that contributed to positive relationships with their co-teachers, saying:

And then we all went to the training, me included, and they invited me to go and I didn’t have to but I wanted to be part of it and wanted to learn...I think it’s really important that the special education teacher, if you want to be considered an equal – you got to put the effort in. So for me it was going to all of the meetings and going to all the trainings and doing it all with them, which they appreciate.

The district’s decision to offer special education teachers the opportunity to attend professional development alongside the general education teachers contributed to an increased sense of proficiency and inclusion in instructional decision-making process for those participants.

Social Influence

Social influence is defined as “the degree to which an individual perceives that important others believe he or she should use the new system” (Venkatesh et al., 2003, p 451). In inclusive classrooms, the co-teaching relationship plays a critical role in the influence that the special education teacher has on the instructional decisions made in the classroom and the ICT tools used. The experiences participants shared can be separated

into three categories: co-teaching definitions, benefits and challenges; the process of co-planning; and the development of the co-teaching relationship.

Co-teaching definitions, benefits, and challenges

The definition of co-teaching, which was outlined in detail in Chapter 2, refers to an instructional delivery method where a general education teacher and special education teacher are paired together within the same classroom to provide instruction and accommodations for both general education students and those with learning disabilities. When asked about their experiences with co-teaching, participants shared the details of the co-teaching models used in their schools and the classes in which they co-teach, benefits of co-teaching, and some of the challenges that come with co-teaching.

Of the twelve participants interviewed, only one (P11) described a service delivery model that could be classified as teaming, where the general education teacher and special education teacher co-deliver instruction to the class equally (Friend et al., 2010). P11 and their co-teacher have the same teaching and planning schedule which allows them to distribute the teaching responsibilities more evenly, and their experience is unique in that they volunteered to co-teach rather than being assigned to a co-taught classroom by district or building administration. They explain by saying “my principal...asked me that content I’d be willing to co-teach or interested in co-teaching.” None of the other participants mentioned having a choice in their assignment to a co-taught setting or the subject in which they were expected to co-teach.

The rest of the participants’ experiences more closely match the model of one teach, one assist, which is the most common model used in secondary co-taught settings

and mirrors the findings in much of the current research. The most common subject was English Language Arts (ELA) for nine of the 12 teachers (P2, P3, P4, P6, P8, P9, P10, P12, P13), followed by math classes for six teachers (P2, P3, P7, P11, P12, P13), social studies for four teachers (P6, P7, P9, P10), and science for two teachers (P1, P4). One participant mentioned additional teaching sections for resource and a social abilities class (P12). All twelve participants reported that they co-taught in at least two different grade levels or subjects, often with combinations of classes from different academic subjects.

Some participants expressed frustration with their placements, with the frequent reassignments to other classrooms or subjects, or the need to learn the content in very different subject areas to be able to support their students. P6, who teaches both ELA and social studies, explains that in their district assignments to co-taught classrooms are “based on need...we typically put one special ed teacher with one content area...there was just a need with the two departments and I was like, yeah, I’m willing to do it.” P1 explained that they have “taught math for the past couple of years. This year I am doing science.” When responding to a question about how long they have taught with their current co-teacher, P8 responded that “this is our second year, and then the year before that I co-taught the class with a different teacher.” P9 shared that for their ELA co-teacher, “this is my second year with her. And then in social studies, this is our fourth year.” P3 explained that this is the “first year for my geometry and my junior English. Now my sophomore English – I’ve worked with him three years.” P13 was unique in reporting that they have been with the same math co-teacher for “at least 10 years” though they went on to say that “...this is my third ELA teacher.” The picture that

emerged from many of the participants' experiences is reflected in the comment by P1, who noted that "there's 50 teachers in the building and I have worked with probably 20 of them." A common thread for most participants was frequent reassignment to different general education co-teachers based on the needs of the building and staff availability without recognizing that co-teaching relationships require time to develop. Co-teachers' relationships and their impact on the instructional decision-making process will be discussed later in this section.

Reassignment to different subject areas or different co-teachers also can create barriers to being able to teach the content in courses at the secondary level, which frequently contain specialized vocabulary terms and deeper understandings of the content than elementary or middle school classes. P9 stated that "you throw me in a math class and I'm going to be a student, not a teacher." P12 agreed, saying "I haven't been in math long enough. I've only been in there two years...it's not my forte." P4 is also in their second year with a co-teacher and said "last year that was a struggle because it's tough...I want to go and do the co-teaching, but also knowing that I'm not an expert in the content." The lack of specific content knowledge was also expressed by P6:

The hard part is as a special ed teacher, we're not masters of the curriculum. And sometimes we're stretched to two and three different contents, right? And so it takes years to really get a sense of...this is the same stuff every year.

This lack of content knowledge can lead to an unequal distribution of teaching responsibilities in the co-taught classroom, with the general education co-teacher providing most of the content instruction and the special education co-teacher playing a

support or assistant role. P10 explained how that situation was causing friction between teachers in their district, saying “it’s a little bit inadequate and I think people are starting to get a little frustrated about that. Not that they’re complaining to anybody above them about what they’re teaching, but there’s clearly an inequity happening.”

The main reason given for reassignment to different subjects or co-teachers was the availability of staff to meet the needs of the students or the building, even though this could interfere with the development and maintenance of co-teaching relationships. P8 expressed this frustration while acknowledging the benefit for students by saying “we’re short-staffed and there’s plenty of reasons, but...it’s meaningful to the students to be able to participate with their gen ed peers. I think it elevates everybody in the room.” While they weren’t pleased with the frequent reassignments, the benefit they found for their students in co-teaching increased their willingness to continue in their role as a co-teacher despite the adjustments needed. P1 shared this view of co-teaching, explaining that students are:

Exposed to more than they would be if they were in a special ed class...they’re exposed to super high-functioning things and then they get partnered with kids and they see the modeling of what it’s ‘supposed’ to look like.

Though they advocate for co-teaching and inclusion, P1 shared their concerns with the lack of co-teaching experience provided in college preparatory programs and how that inadequate training could negatively impact newer special education teachers:

I think the biggest thing for secondary co-teachers and the certification process in college to get certified in SpEd [special education] – it’s not really too in-depth

and it's definitely lacking in the training...there was no observing co-teaching.

There was no participating in it and I think definitely as a newer teacher that's who tends to be in a co-taught class...on top of being a first, second, third year teacher, now you're working with students who can be more demanding. You're dealing with more accommodations. There's just more to add on to your plate.

The first few years of teaching are typically the most challenging, and inadequate preparation, coupled with students who require individualized accommodations, may increase the height of some of the barriers that already exist for newer teachers.

Districts' expectations for co-teaching differed for participants, with some required to co-teach and others having the option to not co-teach. P4's district is one that requires all special education teachers to co-teach, and they explained that the culture in their district is generally very supportive of co-teaching. "We in our department – we all co-teach. No one is strictly the resource room teacher. You typically have a co-taught and a content and some resource rooms so everybody's doing it...everyone has a co-teaching responsibility." The shared experience of co-teaching in their district helped to foster a stronger sense of community among their special education teachers. Conversely, P7 explained that their special education teachers are allowed to choose not to co teach: "We have some special education teachers in our building who are like, I'm not going to co-teach and I'm never going to co-teach. And I think you have to be mindful of people's philosophies and I think that's a big piece." They went on to relate how their district supported their efforts to learn about and implement different co-teaching strategies:

When I moved up to the high school it was more of ‘we don’t co-teach. We don’t do this. We’re not the experts in the content...’ But so many of us were like, this is just natural to do. This is what’s best for kids. So a lot of us just kind of sought out some of that training on our own. The building was great at giving us support to be able to go into other people’s classrooms that are doing this effectively and to watch them and just see what it looks like.

The development of the co-teaching relationships and the impact of those relationships on the instructional decision-making process will be discussed in further detail later in this chapter.

Process of Co-planning

Co-planning refers to the time allotted for instructional decision making and the intentional conversations between co-teachers about the approaches, materials, and accommodations needed to meet the needs of the students in the class. Participants’ experiences varied by district, with some participants reporting that they had little to no dedicated co-planning time, some who were only able to find time co-plan sporadically, and others who had time set aside by their district to co-plan for instruction or accommodations.

Interestingly, those who had the most time allocated for co-planning (P4, P7, P9, P12) didn’t always have the most input in the instructional decision-making process. P4 explained that for them and their co-teacher:

We’re lucky our preps line up because that’s the biggest thing like just having time during the day... We’ll identify some students who struggle in that day while

it's fresh, and then we'll really talk about what's coming up. We'll go through it together.

Despite the dedicated co-planning time, when asked about the amount of input they have in instructional decisions, P4 responded "I'd say a high – like 85 to 90 [percent] is with him and his planning." They go on to explain that their role is mainly the modification of materials and they recognize that "I might not have that same knowledge base for that as he would but in co-planning we sit down and we meet or we talk about hey here's what went really well in the class and here's what didn't." P7 also shared that while they have co-planning time with one co-teacher, "I do not have a common planning with the math teacher I work with. So it's a lot of sharing things electronically. And she is so organized that she usually has her entire unit done ahead of time." They explain that having advanced access to the materials allows them to make the needed modifications for their students, but the initial planning of lessons and materials is not a collaborative process.

P12 explains how their district provides time for co-planning:

So every other month we get a full day to plan together. So the last one I took was with the English teacher and we basically sat down before we started "To Kill a Mockingbird" and we...looked at last year's calendar. We made a new calendar and...just kind of map out what we want to do. So I do get a lot of input -- they've taught "To Kill a Mockingbird" for like the last 15 years.

Having dedicated time for co-planning is not typical, when comparing the experiences of all participants. More common are reports of little to no dedicated co-planning time, with participants carving small amounts of time out of their classes or school days to

collaborate. P6 reported that staffing is one reason for the lack of co-planning time, saying “they try to give us some co-planning time, but we are so stretched in our district.” P3 noted that their district’s policy regarding lesson plans prevents co-planning, explaining that “they [general education teachers] have to have their pacing guides done before school starts.” When asked about the amount of input they have on instructional decisions, P13 responded “I could have 50% if that’s what we chose to do. I don’t choose that. It’s hard when you’re co-teaching two different subjects and teaching resource and flying around the school all day.” They continue by explaining that “the majority of the planning they [general education teachers] do, but I also jump in here and there and choose the tools or whatnot.”

P12, who enjoys dedicated co-planning time this year, related an experience from the previous year that led to their district’s decision to allocate time for co-planning:

We ran into problems with having common collaboration time, especially when you have special ed teachers who teach with four different subjects. So last year I just followed the 12 kids that I had from science to social studies to math to English. There’s no way that I could collaborate with all of them unless I take like one day a week. On top of that we have team meetings on Tuesdays and Thursdays, so that was just not feasible.

What was more common in the participants’ responses was the practice of grabbing a few minutes at the beginning or end of a class to plan. P10 does not have common planning time with their co-teacher and explains that “because I share a room with my global teacher, we just chit chat throughout the day.” P1 shared a similar situation, explaining

that “there is no time to co-plan. In a perfect world you would have the same prep hour and you would be able to sit down and go through everything.” They went on to explain that their co-teacher would “plan things out and then while the kids were working the first five minutes during warm up and the last five or ten minutes of class we would be like hey what do you think about this?” P6 explained that they sought out their co-teachers for collaborative planning sporadically since time is not built into their daily schedule for co-planning:

I have again a lot of open communication and I make it a point to sit down at least two or three times a year and say alright, talk to me. What do you think’s working? What do you think’s not working. What would you like to see me do?

Not all participants wanted to be included in the planning of instructional materials, as shown by P2’s response: “Just because I have my own content...I know what’s happening, but they don’t make me part of their planning process, thankfully. Just because they know my time is so limited.”

When asked about the tasks completed during co-planning, multiple participants (P1, P2, P3, P6, P8, P9, P10, P11) responded that they adjust the instructional strategies and materials chosen by the general education teacher to accommodate for students’ learning disabilities more than helping to select or create the lesson materials. P1 explained that their co-teacher creates the lesson plans “and then run it past me to see if it’s working or if they seem like something’s not working, then they’ll say I don’t know what’s going on. Can you make suggestions?” P2 related a similar situation, acknowledging that the general education teacher makes most of the instructional

decisions, but saying that “...everything’s pretty much ran past us as well...” and noting that their co-teachers are open to suggestions about modifications to instruction. P6 shared how they plan with their co-teacher, saying:

We have a lot of conversations...do you think that Sally, Joey is going to struggle? Do you think you might need to do something for starters...can we do this in a small group with my kids because I really feel like they might benefit?

They went on to note that “we are doing so much of the modifications and IEPs and so a lot of it [co-planning] is through email, through phone calls,” which is a result of the lack of common planning time in their schedules. P4 shared that much of their planning is in comparing the effectiveness of materials and strategies from year to year to make modifications: “what do you think of this? We can try this or this was a disaster last year – how can we do it?” Similarly, P7 explained that their current co-teacher had worked with a different special education co-teacher in the past and shared the accommodations they made.

The gentleman [general education co-teacher] co-taught with somebody else before me, so he already had some recorded, he might have already had some materials modified. So he’s like, do you want to see what is modified already? Do you want to just take it from scratch and do it your way? So he’s great about sending me both, so I can kind of mix and match and obviously it depends on the needs of the student, right? It changes every year and fluctuates.

P9 also shared that co-planning sessions with their co-teacher involve modifications, saying:

So social studies this is the lesson and then I look at it and...say that we read a lot of documents and I make sure that it's on a platform that can be read. I go through and then the vocabulary and we make different versions. Some versions we make highlighted underlined copies. Some versions have simplified language. Some versions are normal.

P9 explained that some of their modifications involve differentiation of the products that students will create to demonstrate their understanding, saying:

How else can they show this information and we go through. Ok, well this kid wants to write it, but how else could this kid do it? What other ways can we do it. And so we brainstorm a lot...we have a lot of choices. We do choices a lot. Pick one of these seven things. Pick two to show how you know this information so it hits all the modalities.

Time to co-plan lessons and make the needed modifications to lesson materials is a critical part of the instructional decision-making process. Special education co-teachers who lack that time with their general education co-teacher may have difficulty providing adequate input about the ICT tools that could be beneficial for students or the accommodations that would help students with disabilities access the curriculum at the same level as their neurotypical peers. Teaching responsibilities and schedules are set by school districts and school building administrators and could be considered one of the facilitating conditions that contribute to teachers' abilities to collaborate, make instructional decisions, and incorporate new ICT tools.

Development of the Co-teaching Relationship

By definition, co-teachers are partners in the instructional process and jointly responsible for the learning for all students in their shared classroom (Friend et al., 2010). Assigning co-teaching pairs to the same classroom, however, doesn't always result in productive and collaborative working relationships. Participants' experiences varied in their willingness to co-teach, the amount of time they have spent with each general education co-teacher, the negotiation of roles within the co-taught classroom, and how the co-teaching relationship affects the level of influence the special education co-teacher has on the instructional decision-making process.

Only one participant indicated that they were asked about their willingness to co-teach and the subject they preferred. P11 shared a conversation with their building administrator, saying "my principal when I made the switch, he asked me what content I'd be willing to co-teach or interested in co-teaching." They also explain that their district's philosophy is "it's a marriage. It's a partnership. So they try to, as long as the [special education] population is there, they will keep you together." Far more common was the involuntary assignment to grade levels, subjects, and general education co-teaching partners within the building, along with frequent reassignments, as discussed earlier.

There seemed to be a correlation between the length of time spent with the same co-teaching partner and the level of influence that the special education co-teacher had on instructional decisions. The exceptions to this seemed to be instances where there was an

intentional negotiation of the roles that each teacher would play in the classroom, which is the situation for P11. They explain that when they were paired with their co-teacher,

We sat down together and essentially looking at the models of co-teaching we knew that we wanted to either do parallel teaching or really what we excel at is one-teach, one-make -multi-sensory...Our goal from the start was anyone could walk into our classroom and no one would know who the special education teacher was, but also could not tell who the students with disabilities essentially were. So that has been our goal. That has been our theme all along. And we have worked really hard to achieve that.

Their examination of the different co-teaching models and intentional crafting of roles within their inclusive classroom, along with the supportive conditions in their district, has enabled them to build a strong working relationship

The co-teaching pairs who have worked together the longest are P1, who has been with one partner for eight years, P12, who has co-taught with one partner for seven years and another for four, and another for two, and P13, who has worked with the same co-teacher for 10 years in one subject and between five and six with the other. P1 explains that “first of all finding the right teacher to be able to do that [co-teaching] with is...honestly it’s like a marriage...sometimes I spend more time with them than I do with my own husband.” P12 details the differences in the depth of co-teaching relationship based on the length of time the partnership has existed and the effect that has on the instructional decisions. They explain: “each co-teacher has a different kind of vibe. Math I don’t touch because I haven’t been in math long enough. I’ve only been in there two

years and we have a brand new teacher this year.” The partnership with the ELA teacher has been in place for four years, and they describe their role in that classroom as “for clarification. He does a great job simplifying on his own but if...they’re really struggling, usually I jump in.” In social studies they state that “my co-teacher is wonderful and she lets me teach as much as I want because I’ve been in social studies every year I’ve been a CT teacher which is seven years. So we co-teach a lot in there.” For this participant, the length of time they have spent with individual co-teachers seems to have a significant impact on the amount of co-teaching they do and the influence they have on instructional decisions.

Similarly, P13 describes their relationship with the co-teacher with whom they have worked for the last ten years as an “equal” one, saying that

In math I am probably more a true co-teacher...I do the warm-up the homework, she does the content. In ELA I usually do the bell-ringer, but it’s really her show...I didn’t go to school to be an ELA teacher or eighth grade math teacher. I went to school to be a special ed teacher, so I’m okay with that.

They acknowledge that their role has increased in the relationships in which they have spent more time, though their training and primary focus is the modifications needed for students with disabilities. For co-teachers who have been frequently reassigned, there is a recognition that the development of the co-teaching relationship is critical to establishing an effective partnership.

When asked about their perception of their level of input on instructional decisions, P6 revealed:

As a special ed teacher, you're walking into somebody else's home, you're walking into their classroom and I've always felt that obviously I have a place there, but I want to make sure to help foster what they're doing, you know? Because if we don't look like we're a team and do what we need to do, then the kids see that...so I have a lot of open communication with the teachers I work with. Now that I'm in a second year with my teachers in social studies, it's definitely becoming more of a...I feel more comfortable hopping in and doing things.

They go on to explain:

That's because of the relationship we have and because I've kind of watched it develop. The hard part as a special ed teacher, we're not masters of the curriculum. And sometimes we're stretched to two and three different contents...and so it takes years to really get a sense of going okay – this is the same stuff every year...now I can feel more comfortable.

P4, who has been working with their co-teachers for two years, agreed that the co-teaching role needs time to develop, saying “that part's growing, so that's definitely something in year one. Last year that was a struggle because it's tough to want to go and do the co-teaching, but also knowing that I'm not an expert in the content.” They also shared concerns with the frequent reassignments, stating “I don't know if you're not with the same person for five-six years. I don't know if you know what that looks like or what your end goal is.” P7 recounted being paired with their co-teacher, saying

That first year we both stayed in our own lanes a little bit and started to slowly weave together. And I feel like having been a consistent partnership for three years now and having two classes together has definitely helped to show like I'm an expert too – just a different expert than what you are and I think you have to have buy-in from both sides to be able to make it effective and to work.

P8, P9, P10, and P11 all shared similar sentiments about their experiences and the importance of allowing the co-teaching relationship to develop and strengthen over time. P2 and P3, who have three years or less with their current co-teachers, do not have common planning time, and have very little input on instructional decisions in the classroom, had very little to say about the relationships with their co-teachers. P3 went so far as to say that “she doesn't want us in there.” They described their limited duties in the classroom, explaining that they are only allowed to interact with the students with disabilities for whom they are responsible, rather than contributing to instructional decisions and assisting all students in the room. Both P2 and P3 shared that their roles were determined by the district in which they work and the individual co-teachers with whom they have been placed and that they have little to no ability to renegotiate their roles within the classroom.

The process of negotiating the roles that each co-teacher will play in co-taught classrooms differed with the participants. Some relationships involved intentional conversations where roles were defined based on the individual strengths or competencies of each co-teaching partner (P6, P7, P8, P9, P10, P11), others adjusted their level of input based on the needs of the classroom in a ‘go with the flow’ approach (P1,

P3, P4, P6, P9, P10, P13), and some explained that they were told what to do by the general education teacher assigned to the classroom (P1, P2, P4, P6, P8, P10, P13). Many of the participants are assigned to more than one subject area or multiple teachers within a subject area, so the negotiation of roles within the inclusive classroom seems to depend on the individuals within each co-teaching partnership rather than a district or building policy.

P7 described how they approached the negotiation of roles in their co-taught classroom, saying “we found out in June that we could be partners. So before the year even started, like that June, we kind of sat down together and talked about different styles of what we could do in the classroom.” P11 described attending a training on co-teaching and how what they learned impacted their conversations about co-teaching roles:

We were trying to get as many people in our district to attend as possible and one of the things they talk about is how it’s a marriage. They talk about one of you is the learning specialist, which is your special education teacher, and one is the content specialist. So when *** and I got paired together and we sat down together and essentially looking at the models of co-teaching we know that we wanted to either do parallel teaching or really what we excel at is one teach one make multi-sensory...Our goal from the start was anyone could walk into our classroom and no one would know who the special education teachers was, but also could not tell who the students with disabilities essentially were.

Approaching co-teaching roles within inclusive classrooms with intentionality and mutual respect recognizes that both the general education teacher and special education

teacher have proficiency in different facets of education and those skills are valued, as P8 explains: “it feels like my strengths are being recognized and it’s kind of fun. Like sometimes I think of us as co-hosts...it’s nice because he values my opinion on things that aren’t just special ed.” P7 shared a similar sentiment, saying “not everybody has that common time to plan or to be together, but I think that is so crucial if it’s going to be successful in the classroom. And you know, people are valued and heard.” They went on to explain:

I feel like it’s that trusting partnership that you have to build between the gen ed teacher and the special ed teacher because you’re both coming like...I’m not the expert in social studies, by any means, but I know enough where I can teach it, right? I can’t always go as in depth as he can, but then I’m more of the person who can handle the modifications and stuff. So we bring different skill sets to the table.

P6 explained how important that relationship is to the functioning of the classroom:

Well as a special ed teacher you’re walking into somebody else’s home, you’re walking into their classroom and I’ve always felt that obviously I have a place there, but I want to make sure to help foster what they’re doing because if we don’t look like we’re a team and doing what we need to do, then the kids see that.

They went on to connect the strength of their co-teaching relationship to their influence on instructional and technology decisions, saying they “definitely think the biggest thing is communication and talking and valuing each other as educators...I think from there it

then, you know, lends itself well to be able to go looking at new technology, looking at new strategies.”

Many of the participants expressed their beliefs that the co-teaching relationship was crucial to their effectiveness in the classroom, and that mutual respect for each other was of great importance in the development of that relationship. P8 explains that “the relationship is really important” and explains that “it’s so beneficial that we get along well, like we jive well with each other.”

While participants expressed the importance of the co-teaching relationships to create effective co-taught classrooms, they were quick to provide strong beliefs that those relationships only developed over time. P6 explained that they “have a lot of open communication with the teachers I work with. Now that I’m in my second year with my teachers in social studies...I feel more comfortable hopping in and doing things because I do modify, but it took us a while to get to that point.” P9 concurred, saying that in “English, this is my second year with her...we’re still getting there. We’re still building that relationship.” P7 explained how their relationship developed over time, saying:

So it was a lot of that first year we both stayed in our own lanes a little bit and started to slowly like weave together. And I feel like having been a consistent partnership for three years now and having two classes together has definitely helped to show like I’m an expert too, just a different expert than what you are and I think you have to have buy-in from both sides to be able to make it effective and to work.

It is interesting that the co-teaching relationship has been identified as a critical part of an effective inclusive classroom by the participants who assert that those relationships require adequate time to develop, but the conditions that seem to lead to stronger co-teaching relationships are often sacrificed for the sake of efficiency or district convenience. Co-teachers are frequently reassigned to new teachers, classrooms, or content areas for staffing reasons, despite the fact that effective partnerships can take years to develop. Arrangements are not made to provide time for co-planning or opportunities for intentional conversations about the roles that each teacher would play in the classroom, though this dedicated time could lead to stronger partnerships and more shared decision-making for instruction.

Summary

In Chapter 4, I explored the role of secondary special education co-teachers in inclusive classrooms in the instructional decision-making process for the adoption and use of ICT tools. The UTAUT (Venkatesh et al., 2003) served as the framework for the study and evidence was gathered about the performance expectancy, effort expectancy, facilitating conditions, and social influence surrounding the adoption and use of ICT tools in co-taught classrooms. In Chapter 5, I provide the interpretation of the findings, along with the limitations, implications, and recommendations of the study.

Introduction

The purpose of this qualitative study was to investigate the experiences of secondary special education co-teachers in the adoption and use of ICT tools in inclusive classrooms. This population has yet to be widely studied and the influence they have over the ICT tools chosen and used in their inclusive classrooms is not fully known. This study was conducted to learn more about participants' experiences adopting and using ICT tools within their co-taught classrooms and to extend the existing literature. The results of this study provide insight into the role that special education co-teachers play in the adoption of ICT tools and the instructional decision-making process within the co-teaching relationship.

The participants shared their experiences using ICT tools, incorporating new ICT tools, detailed the support provided by their school districts, and outlined the role that the relationship with their general education co-teachers plays in the instructional decision-making process and the ICT tools adopted and used. The overall perception about ICT tools shared by the participants was that ICT tools can be beneficial for students with disabilities, help to reduce the barriers to learning created by students' disabilities, and that the potential benefit for students was worth the investment of time and effort needed to gain proficiency with new ICT tools. Participants also expressed their belief that relationships with their general education co-teaching partners had an impact on their ability to participate in the shared decision-making process for ICT tools and instructional materials in their inclusive classrooms. Participants in the longest co-teaching

partnerships reported more comfort with the course content, greater influence over the ICT tools and instructional materials used, and a larger role in the shared decision-making process.

Interpretation of the Findings

The research question for the study sought the experiences of secondary special education co-teachers in the adoption and use of ICT tools in inclusive settings. The interpretations of the findings are guided by the conditions for the adoption and use of technology outlined in the UTAUT: performance expectancy, effort expectancy, facilitating conditions, and social influence (Venkatesh et al., 2003).

Performance Expectancy

Existing research about the uses of ICT tools for students with disabilities is limited as there are few studies with conclusive information on the benefits to students with disabilities; the studies are typically qualitative in nature, have extremely small sample sizes, and effect sizes are rarely reported. The findings from this study about the uses of ICT tools to benefit students with disabilities contribute to the literature by adding detail about the ways special education co-teachers use ICT tools for instruction, dissemination of instructional materials, to increase collaboration between students or students and teachers, to monitor students' activity, to gather formative and summative assessment data, to differentiate instruction, to provide the accommodations specified on students' IEPs, to make content accessible, and to provide organizational support. Participants explained how they leveraged technology to refocus and redirect students, provide accommodations and discreet assistance for learning tasks without being

intrusive and without interrupting whole-group instruction. Tools like speech-to-text make content accessible for students with reading and writing disabilities, provide alternate ways to demonstrate their understanding of course content, and manage the pacing for multiple students to receive testing accommodations in the same classroom. The participants' consensus belief that ICT tools can be leveraged to provide benefits for students with disabilities confirms the findings of Andersen and Sorensen (2017) and Kroesch et al. (2020) that ICT tools can be used to improve student learning and foster increased independence for students with disabilities.

The tools most frequently mentioned by participants were those for accommodations, learning management systems, and content-specific or task-specific programs. The ICT tools for accommodation like text-to-speech or speech-to-text were reported as easy to use and provide significant benefits for students who would be unable to access the content at the same level as their neurotypical peers without those tools. Their ease of use and benefit for students contribute to the frequency of their use. They can be used across content areas and support students' learning in multiple areas, which appear to be contributing factors in their increased frequency of use.

Learning management systems like Google Suite, Schoology, or Microsoft are chosen by school districts and teachers are not typically given a choice in their use. Their implementation is required, and learning how to use them is a necessity dictated by their school districts. Therefore, they have high rates of use. These programs can be used with multiple content areas, allow teachers to share materials digitally with students and families, and are generally easy to use.

The ICT tools that were identified as more difficult to implement were the content-based math program for using the web-enabled calculators and the Screencastify video creation program. Each program was only mentioned and used by a single participant, who described them both as challenging to learn. The calculator program was deemed valuable, and the teacher invested the time to become proficient enough to use it in class without additional training provided by the school district because of the perceived benefit for their specific content area. The participant who reported using the Screencastify program admired the functionality and capability of the tool, but also admitted that the lack of user-friendly interface and the steeper learning curve than was comfortable contributed to sporadic use rather than regular use. This suggests that ICT tools that are content-specific may be used less frequently, and tools that require additional time and training to implement are also used less frequently. ICT tool and application developers who desire their products to be purchased and implemented widely in classrooms and schools should consider the ease of use in their product design process.

The challenges to ICT tool use in inclusive classrooms reported by Anderson and Putman (2020), Boyle and Kennedy (2019), Drelick et al. (2024), Isgett and Wang (2021), Nicu and Bancila (2019), Shaheen and Lohnes Watulak (2019), and Starks and Reich (2023) are echoed in the contributions from participants, who cite the lack of training on ICT tool use, lack of time to gain proficiency with ICT tools, and the lack of availability of both hardware and software as barriers to effective ICT tool implementation. The participants who shared that they have ample time and support to

learn about and implement ICT tools reported higher use of ICT tools in their classrooms. This may be due to the ICT tools not requiring training to implement because they're designed to be user-friendly and easy to use. Those who reported that they were not provided with adequate time or training to gain proficiency in ICT tools felt their lack of comfort with the tools led to a lower incidence of ICT tool use. Whether the lack of training is responsible or the design of specific ICT tools that cannot be implemented before attending training is unclear.

It is interesting to note that the larger number of ICT tools reported did not consistently correlate with the participants who reported the most time and training, indicating that some teachers managed to gain proficiency and successfully implement ICT tools despite the lack of time and support. The teachers in this group expressed their belief that the benefit to students with disabilities was worth the extra, unsupported time and additional effort spent to gain the necessary proficiency with the ICT tools so they could be used to make accommodations and improve the learning experience for students with disabilities. This is consistent with the findings from Andersen and Sorensen (2017), Drelick et al. (2024), and Kroesch et al. (2020), who all described ways that ICT tools can be beneficial for students with disabilities. While the dedication to their students and willingness to learn new strategies is admirable, it also sets a troubling precedent: since time and training were not provided for the participants during their school days, the effort and time to gain proficiency were voluntarily expended during non-school hours. As such, these teachers were not compensated for the time spent in self-study for professional development outside the school day. It is not a reasonable expectation for

teachers to be required to engage in unpaid professional development to learn how to use the ICT tools that will benefit students. If the expectation exists that teachers should use the available ICT tools with their students, then training should be made available by the district and any time outside the school day spent to gain proficiency should be compensated.

Participants reported that districts typically make ICT decisions without seeking their input, though some participants shared experiences of their district's or department's willingness to consider their suggestions for ICT tools. The teachers' degree of input on ICT tools at the district level varied widely and did not seem to follow any predictable pattern. This is consistent with findings from Shaheen and Lohnes Watulak (2019) and Starks and Reich (2023), who reported that teachers are rarely consulted before ICT tools are chosen. At the classroom level and within co-teaching relationships, the participants' reports of the level of input on the choices of ICT tools and their implementation varied widely, though there seemed to be a connection between the level of input on ICT decisions and the strength of the co-teaching relationship. Co-teaching pairs who reported a longer co-teaching relationship, had shared planning time, or an intentional negotiation of roles within the co-teaching relationship had a higher level of input on instructional and ICT decisions in the classroom and more communication about students' needs, which is consistent with the findings from Alnasser (2021), Ansari-Ricci et al. (2021), Cook et al. (2021), King-Sears et al. (2021), King-Sears (2022), Lindacher (2020), Lindner and Schwab (2020), and Weiss et al. (2022).

Effort Expectancy

Effort expectancy refers to participants' perceptions about how easy or difficult the ICT tools are to use, and participants' experiences can be grouped into three categories: tools that are easy to use, tools that have a learning curve, and tools whose implementation was hindered by district decisions. The tools like Google Docs or Peardeck that participants deemed easy to use were frequently adopted and used, with teachers citing an increase in collaboration, increased student engagement, and convenience for teachers as reasons for their adoption and use. Platforms that required time and effort to gain proficiency before adopting for classroom use presented participants with some challenges but were ultimately deemed worth the effort to learn and implement. Teachers believed that the benefit for students was worth the time, energy, and effort needed to learn to use the platform or program. Some ICT tools were classified as difficult to learn and implement, but some participants were willing to invest the time to master those complex tools for their perceived benefit to student learning.

Facilitating Conditions

Facilitating conditions refer to the district approval process, organizational and technical support provided for teachers, the availability of technology coaches or other support staff, and the time allocated for teachers to receive training on the use and implementation of ICT tools. The participants' experiences with their districts' approval processes did not show consistency, as some were aware of the steps needed to gain approval for the use of new ICT tools and some were not. For those who were aware of the processes, there was a recognition that cost and the availability of hardware might

contribute to a district's decision not to purchase or implement a particular ICT tool. The participants who were more aware of the ICT approval process tended to be the ones who reported using more ICT tools in their classrooms, suggesting that transparent and well-communicated approval plans might increase the number and use of ICT tools in classrooms.

Experiences varied significantly in the time allocated for teachers to learn and practice using ICT tools. Those who reported ample time and the ability to attend district-provided professional development correlated with higher usage of ICT tools. Those who felt unsupported or shared that there was a lack of time or training reported that this led to a lack of comfort with the tools and, therefore, a lower incidence of use. The lack of training in the use of ICT tools found in the experiences of participants is echoed in the findings from Anderson and Putman (2020), Boyle and Kennedy (2019), Drelick et al. (2024), Isgett and Wang (2021), Nicu and Bancila (2019), Shaheen and Lohnes Watulak (2019), and Starks and Reich (2023).

The availability of instructional coaches to offer classroom support in ICT tool use does not seem to significantly influence the number or variety of ICT tools used in the participants' classrooms, though the reason for this lack of influence is unclear and could be a subject for further research. Instructional coaches focused on classroom ICT support were not a common occurrence for the participants in my study, so it is difficult to speculate on the reasons that they were not able to assist teachers in incorporating more ICT tools. It is possible that the facilitating conditions in the district required them to support multiple buildings, preventing them from having sufficient time to spend with

individual teachers. It is also unknown whether those technology coaches received any training in ICT implementation or were simply teachers proficient in using technology tools in their own classrooms who chose to assume a role as an instructional coach, as is the case for my district. Individual proficiency with the ICT tools does not necessarily translate to effective methods for coaching and supporting peers, which might be a reason for the lack of apparent influence for the participants in this study. Further study into the qualifications of instructional technology coaches and their job descriptions and responsibilities could help to determine their influence on teacher practice.

Social Influence

The relationship between the special education co-teacher and the general education co-teacher seems to play the largest role in the special education co-teacher's influence on instructional decisions and the adoption and use of ICT tools in inclusive classrooms. Consistent with findings from King-Sears (2022), all but one of the participants were assigned to a co-teaching partnership rather than having the opportunity to volunteer for that role. The co-teaching model of one teach one assist was used most frequently in the participants' classrooms, which is consistent with findings from many previous studies (Alnasser, 2021; Ansari Ricci et al., 2021; King-Sears et al., 2021; Preston-Smith et al., 2020; Tryfon et al., 2021). The frequent reassignment to different co-teachers, different classes, and different content areas was a source of frustration, as this hampered participants' ability to gain proficiency with the course content. Without a solid grasp of content, the special education co-teacher cannot assume an equal role in the shared decision-making process or in classroom instruction, which can lead to tension

and inequity in instructional roles within the co-teaching relationship. This unequal distribution of labor within the co-taught classroom is consistent with findings from Alnasser (2021), Ansari-Ricci et al. (2021), King-Sears (2022), and Preston-Smith et al. (2020).

Districts and administrators seem not to understand the importance of the development of co-teaching relationships, instead seeing special education co-teachers' schedules as flexible and convenient ways to reach compliance with the laws regarding inclusion. True co-teaching is not possible when special education co-teachers are seen as moveable chess pieces to create compliance in scheduling. Course content at the secondary level is highly specialized, and special education co-teachers require time to gain proficiency with the content in each subject and for the co-teaching relationship to develop with each general education co-teacher. The frequent reassignment to different courses, grade levels, and co-teachers to accommodate building scheduling needs could be a contributing factor to the abundance of one teach-one assist service delivery models and reduction in the special education co-teachers' roles to unequal partners in the instructional decision-making process. Future research should be conducted on co-teaching pairs who have been allowed to remain in the same classroom for multiple years to determine the impact of time on the development of the co-teaching relationship and the impact that has on the nature of the role the special education co-teacher plays in instructional decisions.

Participants' experiences with the development of the co-teaching relationship varied widely and was influenced by their willingness to co-teach, the availability of co-

planning time during the school day, time spent in partnership with their co-teacher to allow the co-teaching relationship to develop, and the intentional negotiation of roles at the beginning of the co-teaching relationship. This is consistent with findings from several studies that highlight the need for communication, training, and the negotiation of co-teaching roles to build effective co-teaching partnerships (Alnasser, 2021; Ansari Ricci et al., 2021; Cook et al., 2021; King-Sears et al., 2021; Tryfon et al., 2021). The special education co-teachers who had shared co-planning time with their co-teachers, were allowed to co-teach with the same teachers and subjects for multiple years, and had agreed upon the roles each co-teacher would play in the classroom tended to have a more equitable share in the instructional decision-making process and ability to suggest ICT tools than participants who were involuntarily assigned to co-taught classrooms, do not have shared co-planning time, and experience frequent reassignments to new classes or co-teachers.

Limitations of the Study

The nature of qualitative research and the interpretation of others' experiences can be subjective and therefore measures must be taken to minimize bias and increase objectivity (Ravitch & Carl, 2021). As a general education teacher who has worked with several different special education co-teachers who was also the data collection instrument, there was the possibility that I introduced bias during either data collection or analysis. A scripted interview guide was used to minimize bias and facilitate data collection during the semi-structured interviews, though participants were invited to share their experiences freely. It is possible that my prior experiences influenced the flow of the

interview because I was the data collection tool, which could be a limitation for this qualitative study (Rubin & Rubin, 2012).

The sample size for the study is also a limitation. Twelve participants were interviewed and their responses analyzed for this basic qualitative study, which is consistent with Guest et al.'s (2006) recommendation to reach saturation for homogeneous populations. Though measures were taken to secure participants from multiple states, different school demographics, and rural, urban, and suburban areas, the small sample size is insufficient to make generalizations to a larger population. Additionally, eleven of the participants were female and only one was male. More participants from diverse areas in the country and with a more equal mix of female and male participants would present a more complete picture of the experiences of secondary special education co-teachers in inclusive classrooms.

Recommendations

Based on the results from this study, here are recommendations for co-teaching at the secondary level and the use of ICT tools in secondary inclusive classrooms. According to the predictions in the UTAUT, co-teaching using ICT tools will work when the performance expectancy exceeds the effort expectancy for specific ICT tools. When teachers recognize that a specific tool provides benefit for students, provides alternative ways for students to demonstrate their understanding, promotes collaboration and communication, or can remove some of the barriers to learning created by students' specific learning disabilities, they are more likely to invest the time and effort to learn how to use it or to request or seek out training in its use. Allowing teachers to find and

implement ICT tools that they deem beneficial could increase the incidence of ICT use by increasing the performance expectancy for those tools.

Conflicts arise when teachers don't have the agency to suggest or implement ICT tools that could be beneficial because the facilitating conditions in the form of district approval processes for ICT tools are unknown, unpublished, or are cumbersome to complete. When districts implement district-wide shifts in the ICT tools available for use and do not provide training, switch platforms often, or choose tools with a significant learning curve, the effort expectancy will outweigh the performance expectancy and teachers will be less likely to embrace the changes. Any large-scale changes in ICT tools should offer training and time for teachers to gain proficiency before classroom implementation. This changes the effort expectancy on the teachers' part, as there is support for them to learn to use the tools and may result in increased or more consistent use of those tools in the classroom.

True co-teaching that moves beyond the one teach-one assist service delivery model requires the general and special education co-teachers to be equal, collaborative partners in the classroom. Co-teaching using ICT tools will work better when both teachers have volunteered to co-teach and therefore have agency in their teaching assignments, are placed together for multiple years in the same classroom to allow the co-teaching relationship to develop, and have dedicated co-planning time during the school day. These conditions are consistent with the predictions from the UTAUT about the facilitating conditions for ICT adoption that would allow co-teaching relationships to move beyond shared placement in the same classroom to a true partnership where both

co-teachers have equal responsibilities in the instructional decision-making process and can work together to effectively implement ICT tools that will improve student learning. This stronger relationship between co-teachers also fits with the UTAUT's prediction about the impact of social influence on the adoption of ICT tools. If both co-teachers work together to develop and select instructional materials within an established co-teaching relationship, they are more likely to embrace the use of ICT tools that one co-teacher feels will be beneficial for their students.

Additional facilitating conditions predicted in the UTAUT for the successful implementation of ICT tools in inclusive classrooms are the time and training needed for co-teachers to be comfortable enough with the tools that they can incorporate them into existing lessons, teach students how to use them, and be proficient enough to troubleshoot issues when they arise. These skills require either training in the form of professional development for the teachers who will be expected to use the tools or the hiring of tech-savvy teachers who will willingly devote their own unpaid time to learning how to use the tools. Since finding teachers who fit the latter category may prove difficult, as this requires teachers to choose to engage in unpaid professional learning outside of their contractual hours, successful implementation of ICT tools requires districts to devote the time and financial resources for training for teachers.

While this study contributes additional information about the experiences of special education co-teachers in inclusive classrooms, more research is needed in the following areas:

- the development of effective co-teaching relationships at the secondary level and the conditions that lead to a more equitable division of labor within inclusive classrooms
- how the facilitating conditions within school districts contribute to or detract from the development of effective co-teaching partnerships
- the efficacy of co-teaching environments for students with disabilities and the long-term effects of inclusion on student success

Some of the difficulties I encountered while conducting this study were the lack of consistent terminology or definition for co-teaching or inclusive classrooms, extremely small sample sizes for studies, and a lack of reported effect sizes. Those conducting research on co-teaching should ensure that searches for current literature include the synonyms for co-teaching that include cooperative teaching, team teaching, inclusion, and inclusive education. Additionally, researchers should be intentional with research designs that secure adequate participants and report effect sizes along with their findings.

Implications

A majority of students with disabilities spend at least part of their school day in inclusive settings, learning alongside their neurotypical peers. While co-teaching has been hailed as the solution to the problem of the support these students need in the general education classroom, there are strong suggestions that simply having two teachers in the same room does not make for an effective co-taught classroom. The results of this study suggest that prioritizing the establishment and nurturing of co-teaching partnerships with teachers who voluntarily enter into such arrangements, are given the training, time,

and tools to support their professional growth, and are encouraged to have intentional conversations to negotiate their roles within the co-teaching relationship could lead to more effective and equal partnerships. The increase in equity within those partnerships could allow special education co-teachers to move beyond the one teach-one assist role found in most inclusive classrooms and have a greater influence on the instructional materials, including ICT tools, used in inclusive classrooms.

Combining the special education co-teachers' knowledge of students' needs with the ICT tools available for accommodations and modifications could improve teaching conditions for co-teachers and learning outcomes for students with disabilities. This expanded role for special education co-teachers and greater success for students with disabilities could lead to positive social change for both the adults and students in inclusive classrooms.

Conclusion

Little is known about the experiences of secondary special education co-teachers in the adoption and use of ICT tools in inclusive classrooms. In this study, I explored the experiences of secondary special education co-teachers in the adoption and use of ICT tools in inclusive classrooms. With the continued and increasing use of inclusion as the least restrictive environment for many students with disabilities, the role of co-teachers and the importance of the co-teaching relationship on students' success must be more fully understood. The findings from this study add to the understanding about the ways that co-teachers use ICT tools within co-taught spaces to make accommodations for students with disabilities, allow students to experience success in the general education

classroom, access curriculum in ways that harness ICT tools to compensate for their learning disabilities, and provide the necessary support for students with disabilities to learn alongside their neurotypical peers. Participants also shared their frustrations and challenges with frequent reassignments to different classrooms and co-teachers, the lack of time and training for ICT tools, the lack of support they feel from their schools and districts, and how that lack of support affects their ability to assume a more equitable role within the co-teaching relationship. The findings from this study suggest that the co-teaching relationship has a strong influence on the role that the special education co-teacher plays in the instructional decision-making process, including the selection and adoption of ICT tools to assist students with disabilities. According to the results of this study, the conditions that could lead to effective co-teaching relationships capable of using ICT tools to support student learning are continued placement of a special education co-teacher with the same subject and general education co-teachers for multiple years, selecting co-teachers who volunteer to work in a co-taught environment rather than classroom assignments made to accommodate school building scheduling constraints, allocation of shared co-planning time during the school day, and the access and ability to receive training on co-teaching, collaboration, and the implementation of ICT tools. These decisions rest solely within the control of school districts, who must recognize the importance of creating an environment that prioritizes the development of effective co-teaching partnerships with strong collaboration over staffing efficiency. Devoting resources to co-teaching like shared co-planning time, training for co-teaching, allowing co-teaching partnerships to develop over time, and offering training and support

for the adoption and use of ICT tools could enhance the quality of instruction in co-taught classrooms and contribute to positive social change for both co-teachers and the students in their care.

Further research is needed on the development of the co-teaching relationship and the role of the special education co-teacher in the instructional decision-making process. Research is also needed on the ICT tools most frequently used in inclusive classrooms to support students with disabilities and the reasons those tools were chosen over others.

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Appendix: Interview Guide

Background information:

- Name
- Could you tell me a little about your school?

ICT Tools:

- What kinds of ICT tools are frequently used in your classroom?
 - How are those tools used?
- How have those tools helped students in your classroom?
 - Could you give specific examples?
- In your experience, how useful are ICT tools for improving teaching and learning?
- Tell me about your experiences with incorporating new ICT tools in your classroom.
 - What problems were you hoping to solve?
 - Why did you start using those specific tools?
 - Tell me about how easy/difficult they were to use/implement?
 - What made them easy/hard?
 - Describe the input that you had on the choice of those tools?

Co-teaching information:

- How long have you been co-teaching? (How long with your current co-teaching partner?)
- Could you tell me about your teaching relationship with your current co-teaching partner?
 - Describe the process of figuring out your roles within that co-teaching relationship.
- Could you walk me through a time when you and your co-teacher plan lessons?
 - How would you describe the instructional decision-making process?
 - How do you feel about your role in that process?
- Describe the decision-making process for implementing ICT tools.

- Who makes the initial suggestion, comes up with ideas for implementation, sets the goals for improving teaching and learning?

Resources and Support:

- Could you tell me about the training provided by your school/district for ICT tools?
- Describe the process of approval in your school/district for implementing a new ICT tool.
 - Could you provide an example of one that you or your co-teacher have implemented?
- Could you tell me about any ICT tools that you have stopped using?
 - Provide more details about why or who made the decision to reject that tool?

That concludes the questions I wanted to ask. Is there anything else you would like to share with me about your experiences before we conclude the interview?