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## Special Education Teachers' Experience Implementing Constant Time Delays on Young Adults with Autism Spectrum Disorder to Improve Employment Stability

Ayodele Salihu  
*Walden University*

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# Walden University

College of Psychology and Community Services

This is to certify that the doctoral dissertation by

Ayodele Salihu

has been found to be complete and satisfactory in all respects,  
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the review committee have been made.

Review Committee

Dr. Patricia Loun, Committee Chairperson, Psychology Faculty  
Dr. Valerie Worthington, Committee Member, Psychology Faculty

Chief Academic Officer and Provost  
Sue Subocz, Ph.D.

Walden University  
2025

Abstract

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Ayodele Salihu

MS, Canisius College, 2013

BA, University of Buffalo, 2011

Dissertation Submitted in Partial Fulfillment

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## Abstract

Individuals with autism spectrum disorder (ASD) often encounter challenges in securing and maintaining employment. With appropriate support, they can gradually develop the functional and social skills necessary to perform job tasks independently, fostering long-term employment and greater autonomy. Achieving independence depends on both the cognitive abilities of individuals with ASD and the instructional strategies educators employ to engage them effectively in the learning process. Constant time delay (CTD) is an evidence-based practice that has demonstrated significant benefits for individuals with ASD in skill acquisition and task mastery. This qualitative study explored the experiences of special education (SPED) teachers in implementing CTD to enhance employment outcomes for individuals with ASD. Guided by Vygotsky's social development theory, this study emphasized the role of guided learning and social interaction in promoting autonomy. Data were collected through semi-structured interviews with seven SPED teachers trained in CTD implementation. Thematic analysis revealed seven primary themes: training and preparation, CTD implementation process, baseline and skills assessment, social interaction and communication, barriers and challenges, outcomes and impact, recommendations for improvement. Participants noted that CTD fostered confidence and self-initiation, especially when applied to natural job settings with individualized goals, to support skill transfer. Overall, the findings indicate that CTD is a powerful tool that can support positive social change through both functional skill development and social integration. This implication extends to professional development, interagency collaboration and policy, calling for systematic approach that uphold equity, dignity, and long-term success for the autism community.

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## Dedication

I dedicate this dissertation to my family, friends, and loved ones. Without the love, support, sacrifice, and encouragement of everyone, this journey would not have been possible.

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## Chapter 1: Introduction to the Study

The purpose of this study was to examine the experiences of special education (SPED) professionals in implementing the constant time delay (CTD) strategy for young adults with autism, aged 18 to 40, in employment settings. According to research, CTD is an evidence-based practice (EBP) that is especially effective in teaching individuals with autism spectrum disorder (IASD) in different learning settings (Brock et al., 2017; Brock & Carter, 2013; Spooner et al., 2017; Walker & Smith, 2015). CTD has been used to teach academic skills, vocational skills, life skills, social skills, and community skills (Horn et al., 2020).

Nonetheless, most of the studies on CTD are often carried out in educational, vocational, and community settings where employment is not the primary objective (Bennett & Dukes, 2013; Bozkurt & Gursel, 2005; Riesen et al., 2003; Swain et al., 2015). Because there is not much research on CTD in a job setting for students with ASD (Horn et al., 2020), this research was conducted to understand the experiences of SPED teachers implementing CTD in a job setting to explore how they support IASD to achieve employment outcomes. This is important because it will inform the development and delivery of SPED employment training services and then allow students to apply the skills they have learned in the classroom to real-world situations, like in a job setting (Horn et al., 2020; Rakap, 2017; Yücesoy-Özkan et al., 2019). It is important to note that when implementing CTD for young IASD, the teacher addresses learning and comprehension deficits to improve various skills such as on-task activity and response

time, which is useful for better student engagement during instruction for future employment outcomes (Bennett & Dukes, 2013; Roux et al., 2013; Test et al., 2009).

The CTD strategy is a systematic instructional strategy that uses a fixed amount of time between the instruction and the prompt, and as the learner becomes proficient at the new skill, the fixed time is increased until mastery to help the student become more independent and less dependent on prompts (Horn et al., 2020). Studies indicate that systematic instruction like CTD is highly useful for IASD (Browder et al., 2009; Horn et al., 2020; Riesen et al., 2003; Walker, 2008; Zisimopoulos et al., 2011), even more so when the teacher can implement scaffolding to support the students in eventually gaining their autonomy by completing the task independently (Vygotsky, 1978). The teacher's role is important in this area to assist the students in reaching their full potential. As such, teachers may implement instructional strategies and develop learning objectives within a student zone of proximal development (ZPD) to effectively bridge the gap between what the learner can do without the teacher's assistance and what the student can achieve with the teacher's guidance to improve the student's academic level (Brownfield & Wilkinson, 2018).

In essence, this research explored the experience of SPED teachers implementing CTD to support young ASD students in a job setting. Gathering these experiences can be beneficial to teachers, researchers, school administrators, and policymakers by improving understanding of the existing gap in research regarding the experiences of SPED teachers when applying CTD to IASD in a job setting.

## **Background**

Autism is a lifelong development disorder that continues through adulthood (Knight & Sartini, 2015). Autistic individuals have unique strengths well suited for a wide range of careers, and with adequate support, they can reach their full potential (Cheriyana et al., 2021). Many successful individuals happen to have ASD including entrepreneur and business magnate Elon Musk, scientist Temple Grandin, comedian Dan Aykroyd, and Nobel prize winner Dr. Vernon Smith (Kelheim, 2023). Considering the success of IASD in achieving their full potential, researchers have focused on employment as an area of research and are studying ways to help people with ASD live better lives on their own. Research indicates several factors are responsible for IASD deficits during learning such as comprehension challenges, social interaction deficits, communication issues, and behavior challenges, which could also impede young IASD from learning the skills necessary to acquire and retain gainful employment (Witmer & Ferreri, 2014). Bross et al. (2021) agreed that employment is especially difficult for young IASD to maintain.

In the United States, the prevalence of individuals diagnosed with ASD had increased to 27.6 in 1,000 children in 2020. This means that currently 1 in 36 children in the United States get diagnosed with ASD, up from 1 in 150 children 20 years ago (Centers for Disease Control and Prevention, 2023). An estimated 2% of adults in the United States have autism (Centers for Disease Control and Prevention, 2023). Adults with ASD are 50%- 75% more likely to be unemployed than adults with other disabilities

(Hendricks, 2010), which is higher than the current national unemployment rate of 4% (U.S. Bureau of Labor Statistics, 2024). However, nearly 6% of people with autism in the United States are employed after receiving the needed support that would enable them to keep a job (U.S. Bureau of Labor Statistics, 2023).

Young adult students with ASD require systematic instruction like CTD and proper transitional services from the post-secondary to the community setting for positive employment outcomes (Bennett & Dukes, 2013; Horn et al., 2020; Roux et al., 2013). However, most of the application of CTD has occurred in the classroom (Coleman et al., 2012; Jameson et al., 2007; Jimenez et al., 2012; Riesen et al., 2003; Swain et al., 2015) or in vocational training (Bozkurt & Gursel, 2005; Branham et al., 1999; Miller & Test, 1989). In addition, CTD has been applied in community settings without job focus (Branham et al., 1999; Morse & Schuster, 2000; Swain et al., 2015). Only Horn et al. (2020) looked at employment acquisition in a community setting where four participants were hired to work in the men's department store. Horn et al. indicated that the ASD students were asked to arrange clothing on the rack to their sizes at the men's store, Furthermore, when the students were able to carry on the tasks independently, the teacher gradually faded the instruction and praised the students for keeping up with the good work. The study further indicated that the students showed significant improvements on the job when the constant time delay strategy was considered. Horn et al. indicated that participants can significantly improve their job skills when innovative teaching methods like constant time delay strategy are considered in helping IASD gain essential job skills

which can enhance the student's employment outcome.

To implement the CTD strategy, teachers require ongoing training that consists of coaching and feedback, to ensure that teachers have the skills they need to teach the students effectively (Council for Exceptional Children [CEC], 2015; Oncul, 2022; Wolery & Hemmeter, 2011). Considering that there is lack of research on CTD implementation in a real job situation, this research explored the experiences of SPED teachers who are using CTD with young IASD between ages 18 years and 40 years old in a job setting to further develop and understanding of teachers' experience on how CTD is being implemented in a real job setting.

### **Problem Statement**

A major problem related to the implementation of CTD in young ASD, between the ages of 18 and 40 in a job setting, is that while CTD has been used to teach various skills including academic abilities, job-related skills, essential life skills, interpersonal skills and community skills (Horn et al., 2020), most of the research on CTD has typically been conducted in educational, vocational, and community environments where keeping a job is not the main goal (Bennett & Dukes, 2013; Bozkurt & Gursel, 2005; Riesen et al., 2003; Swain et al., 2015). Young adults with ASD are significantly underrepresented in employment, and Horn et al. (2020) is the only study that looked at the effectiveness of constant time delay to enhance job related skills. Though Horn et al. indicated that CTD can be effective in a job setting, the research focused solely on the effectiveness of the intervention in a particular job skill, raising questions about its lasting

effects on other job skills. The participants were tasked with organizing clothes on a rack according to their sizes in a men's department store, and as the students demonstrated their ability to perform these tasks on their own, the instructors slowly reduced the level of guidance and commended the students for their consistent performance. However, when a student incorrectly arranged the clothes (for example, placing an XL before a M) and needed three reminders to fix it, this was recorded as a correct response after prompts. It would have been helpful to document and share the accurate rates of mistakes made by each student.

While there is limited research on CTD in an employment setting for students with ASD (Horn et al., 2020), there is a lack of research on how to train teachers to consistently use the CTD strategy (Oncul, 2022). Oncul (2022) examined how pre-service SPED teachers implement constant time delay strategies to ensure effective learning outcomes and identify challenges that may influence the outcome for students with special needs. Though this study did not take place in the job setting, it has a significant implication for providing more teacher training for special education teachers to enhance the skills and confidence of SPED teachers when implementing constant time delay. Oncul noted that educators in training face difficulties in applying CTD strategies that require high treatment integrity, and they require assistance through performance feedback or guidance.

Several factors contribute to the challenges teachers have when implementing CTD strategies, such as teachers in the classroom rejecting a new method, feeling left out

in the decision to adopt new methods, lack of proper training, receiving insufficient training, not having enough practice time, or not getting technical help in applying the strategy as intended (Kretlow & Bartholomew, 2010). Additionally, it is unclear how SPED teachers handle giving praise, corrections, or rewards during CTD teaching in the classroom. Similarly, Wolery and Hemmeter (2011) suggested that teachers tend to shy away from direct and structured instruction, and often face a lack of support, lack of necessary skills, are inadequately prepared, receive minimal ongoing education, and lack innovation in how they plan their classroom schedules. Despite CTD challenges, research indicates that CTD is especially effective in teaching IASD in different learning settings (Brock et al., 2017; Brock & Carter, 2013; Spooner et al., 2017; Walker & Smith, 2015). The key is that the IASD who has been able to use CTD to learn and eventually master a skill correctly in the classroom, vocational, and community settings should be able to demonstrate those skills learned in the classroom into a job setting independently. For example, a student who already knows how to independently sort clothes, fold them, and place them where they need to be could also perform these steps in various department stores without relying on the teacher's instruction.

The IASD requires assistance in learning more efficiently to enhance their thinking abilities which are crucial for their daily living, work, and involvement in social activities (Akcin, 2013). Therefore, given that it is challenging for young adults on the autism spectrum to keep jobs and the use of CTD has proven beneficial for teachers in educational settings, vocational training, and community environments, this study

explored the experiences of special education teachers in applying CTD in a job setting.

### **Purpose of the Study**

The purpose of this basic qualitative study was to explore the experience of special education teachers implementing a constant time delay strategy for young adults with autism in a job setting.

### **Research Question**

What are the experiences of SPED teachers implementing CTD strategy for young ASD in a job setting?

### **Theoretical Framework**

The theoretical framework for this qualitative research was built upon Vygotsky (1978) social development theory (SDT), which emphasizes the fundamental role of social interaction in cognitive development. At the heart of his theory is the ZPD that describes the gap between the learning activities a student can accomplish with the aid of someone such as more knowledgeable others (MKO) and what they can do by themselves. This concept suggests that optimal learning occurs with the support of an MKO such as the teacher, classmate, aids in facilitating comprehension and skill acquisition. The role of MKOs is crucial because they offer support, critique, and structure to assist the student in moving forward through their ZPD to promote deeper understanding. The theoretical underpinnings of Vygotsky's social development context guided the study design, research problem, and research question. Chapter 2 will provide more details about Vygotsky, SDT, and how it connects to the study.

### **Nature of the Study**

The nature of this study was basic qualitative research, which is well-suited for exploring how individuals make sense of their experiences in a particular context. This study specifically examined the experiences of SPED professionals in implementing the CTD instructional strategy with IASD in employment settings. A basic qualitative design aims to understand how people interpret and derive meaning from their lived experiences (Merriam & Grenier, 2019), making it appropriate for this inquiry.

To gather rich, descriptive data, I conducted semi-structured, face-to-face interviews with 10 SPED teachers. These participants were selected through purposeful sampling based on specific criteria, including their years of experience, educational background, and training in working with young individuals with ASD. In qualitative research, sample size is determined by data saturation, which occurs when no new themes or insights emerge during data analysis (Patton, 2015). The collected data were analyzed using NVivo 12 through thematic coding, which allowed me to identify patterns and themes related to how CTD was implemented in real-world employment settings. This approach provided a deeper understanding of SPED professionals' perspectives and practices and how CTD may support improved employment outcomes for IASD.

### **Definition of Terms**

The definitions of terms provided are presented to provide clarification and further understanding of the term usage.

*Autism spectrum disorder (ASD)*: A developmental disorder that presents with

atypical language and social behavior, along with restrictive and repetitive behaviors and unusual interests American Psychiatric Association (APA, 2013).

*Constant time delay (CTD):* A type of intervention strategy used in the field of special education and other related field for individuals with autism and other learning disabilities. It uses a consistent time delay between a stimulus e.g. asking a question or giving an instruction and then a prompt to ensure that the learner responds correctly (Horn et al., 2020).

*Data collection:* A data form used to make instructional decisions during CTD implementation (Belfiore & Browder, 1992; Browder et al., 1986).

*Evidence-based practice:* A systematic approach that involves providing evidence based empirical findings to inform professional practice (Sturmey, 2014).

*Generalization:* The ability to apply skills learnt naturally without prompt (Collins et al., 2010).

*Graduated guidance:* When the teacher uses a teaching technique to help the IASD learn skills that require physical assistance (Cooper et al., 2007).

*More Knowledgeable Other (MKO):* Anyone more capable than the learner in providing support during teaching (Pomerantez & Pierce, 2019). For this study a peer, SPED teacher, and content experts are considered MKOs to provide new knowledge during the implementation of CTD.

*Most to least:* A teaching strategy that involves intrusive prompts which uses physical guidance to teach and fade prompt over time. This strategy can be used to teach

picture schedules and promote task behavior, cooking, and sewing (Aykut, 2012; MacDuff et al., 1993).

*Progressive time delay:* A procedure designed to result in errorless (or near-errorless) learning of skills by children with and without disabilities, which involves the teacher providing the student with a prompt by giving the student time to respond correctly and engage in correct behavior. The progressive time delay allows more flexible time, unlike CTD (Kurt, 2012; Tekin Iftar et al., 2011; Wolery et al., 1988).

*Prompting:* A system which an instructor uses to send a message to the learner after a fixed, predictable delay (Wolery et al., 1992). There are different types of prompting, which includes simultaneous prompting, time delay, system of least prompts, most to least intrusive prompts, and graduated guidance.

*Quality indicator:* A systematic method used to evaluate the context, environment, demographic characteristics, details of the intervention, how closely it is implemented, the responsibilities and qualifications of the person delivering the intervention, and the measures used to assess the effectiveness of the intervention (Cook et al., 2014).

*Reinforcement:* When a learner receives a reward or punishment from the teacher to promote accuracy of the students' responses, such as praise, extra time outside, extra time on the computer, and stickers (Cooper et al., 2007).

*Scaffolding:* An instructional practice used to meet students at their cognitive level, by slowly removing guidance and assistance to build student mastery of what they

are learning and ability (Vygotsky, 2011).

*Systematic instruction:* An instructional strategy that follows a clear, sequential method of instruction in helping students build on already mastered skills to new and more difficult skills (Alberto & Troutman, 2009; Spooner et al., 2011).

*Simultaneous prompting (SP):* A response-prompting procedure composed of probe and instructional trials. SP procedures start with probe trials and then transition to instructional trials. During the probe trials, a target stimulus is presented to assess skill acquisition, and during the instructional trials, the target stimulus and the controlling prompt are presented at the same time (Collins, 2022). This strategy uses one response prompt (i.e., verbal, model) presented concurrently with the target stimulus, which is removed after multiple instructional trials. This type of prompting is best used to teach discrete or chained tasks and is simpler than other prompting strategies (Morse & Schuster, 2004).

*System of least prompts:* A progression procedure in which a prompt hierarchy is delivered beginning with the least intrusive prompt, with subsequent prompts expanding in level of assistance, and ending with the controlling or most intrusive prompt needed for the target response to be emitted correctly. For each trial, the child first has an opportunity to respond freely. Then another intrusive prompt in the hierarchy is delivered for no or incorrect responses (Demchak, 1990). This strategy is used to teach listening to comprehension and reading comprehension (Browder et al., 2009; Jimenez et al., 2012).

*Young adulthood:* 18 years to 40 years (Erikson, 1982).

*Zone of proximal development (ZPD)*: is a concept in educational psychology that defines the gap between what a learner can do on their own and what they can do with adult guidance and more knowledgeable others (Vygotsky, 1978).

### **Assumptions**

This study was based on several assumptions. The first assumption was that the face-to-face, semi-structured interviews would provide me with in-depth information to answer the research questions. The second assumption was that the SPED teachers accurately described their experience with implementation of CTD to young ASD in a job training program. The third assumption was that the SPED teachers know how to use the strategies as intended. To address these assumptions, I assumed that providing the participants with the purpose of the study before the interview and assuring them of confidentiality should lead to responses that reflect their experiences (Simon, 2011).

### **Scope and Delimitations**

In this study, I explored the experience of SPED teachers implementing a CTD strategy in a job setting. This research considered interviews with 10 or more SPED teachers to gain knowledge of each participant's experience. I considered the participants' years of teaching experience with teaching young ASD between ages 18 and 40, level of education, and years of experience implementing CTD in a job setting. The interview questions provided information about the experience of SPED teachers implementing CTD through the lens of ZPD to answer questions related to the development and delivery of constant time delay strategy to better support high

functioning IASD with moderate cognitive challenges in a job setting.

### **Limitations**

The study was limited to job settings that offer employment for only the ASD population. Another limitation was that there are a limited number of centers that I knew of that offered employment and training for the IASD that involves a real-life job setting and special education teachers teaching the young IASD. This demonstrates that many facilities that coordinate ASD job training centers do not have the option of real employment and SPED teachers teaching the students. Another limitation that emerged in the final study was the small sample size. I had a limited number of SPED teachers who met the criteria to participate, and few had prior experience using CTD to improve employment outcomes. Due to the small sample size, I may not have obtained as much high-quality data as anticipated, which would contribute to research and practice.

### **Significance**

The use of CTD has been beneficial for educators across various settings including classrooms, vocational training, and community environments in helping students showcase their acquired skills. However, there is a noticeable lack of emphasis on applying CTD in real-world scenarios. The outcome of this research could lead to beneficial societal changes by raising awareness among teachers, administrators, researchers, and policymakers about how SPED teachers implement CTD in a job setting and the challenges faced by the SPED teachers. Understanding the CTD strategy through which special education teachers implement CTD can provide valuable insights into their

teaching approaches. The results of this study could inform the development and delivery of transition services for high functional autistic youth with ASD, as well as equip teachers, administrators, and researchers with the knowledge to identify areas for improvement in ASD job training. This could better address the diverse learning needs of ASD students, ultimately enhancing their employment prospects.

### **Summary**

In Chapter 1, I presented the background information on the importance of CTD, defined the problem, stated the purpose of the study, and presented the research question connected to the study. I indicated the lack of CTD implementation in a job setting and the importance of using CTD to teach job skills to improve employment outcomes. I also presented SPED teachers' challenges implementing CTD. I presented the theoretical framework and statistics on the need for employment support for the IASD. Then, I defined key terms; discussed the scope, assumptions, delimitations, and significance of the study; and summarized major points.

Chapter 2 will provide more information on the theoretical framework by Vygotsky theory and provide valuable insight into how SPED teachers can use the theory to support IASD during CTD implementation in a job setting to guide the research question. I then explore literature related to CTD implementation challenges, strengths, and weaknesses found in the literature to connect my focus.

## Chapter 2: Literature Review

Employment is difficult to maintain for young adults with ASD. Even among those who are considered highly functioning, fewer than 5% are competitively employed (Engstrom et al., 2003). The major challenges for this population with maintaining employment are the communication, social, and cognitive deficits that impact their learning, which require support from a job coach or SPED teacher in the workplace setting to achieve better outcomes (Allen et al., 2012; Murza, 2016). The young ASD learner often requires systematic instruction from the teacher to independently perform a task, which is critical to positive employment outcomes (Bennett & Dukes, 2013). Systematic instruction is an effective way to tutor students with ASD (Browder et al., 2014; Spooner et al., 2017). According to the principles of applied behavior analysis, systematic instruction involves the use of EBP for students with ASD in a clearly defined way through prompting and feedback to help the students learn (Collins, 2022).

CTD involves the use of systematic instruction that has been shown to support individuals with ASD to achieve life skills, community skills, social skills, and academic skills in different settings (Browder et al., 2009; Riesen et al., 2003; Walker, 2008; Zisimopoulos et al., 2011). However, there is not much research on applying CTD in a job setting (Horn et al., 2020) CTD is a strategy used to ensure that a student can eventually apply the skills learned without the teacher's guidance, which is useful for keeping a job (Browder et al., 2009; Riesen et al., 2003; Walker, 2008; Zisimopoulos et al., 2011). Even though studies have indicated the success of CTD, SPED teachers

experience challenges during CTD implementation, which includes teachers not having enough help, unskilled teachers, lack of creativity with the class schedule, lack of clarity in data reports, teachers not using prompts properly, and prompts not being reinforced or corrected immediately, which could compromise the learning outcome (Daugherty et al., 2001; Hughes et al., 2002; Oncul, 2022; Wolery & Hemmeter, 2011).

Several research studies have concentrated on the advantages and difficulties special education teachers encounter in implementing CTD strategies in the classroom, vocational training, and community settings. The studies focus on CTD teaching methods (Daugherty et al., 2001; Hughes et al., 2002; Kretlow & Bartholomew, 2010; Nougaret et al., 2005), procedures (Kurt & Tekin-Ifar, 2008), the effectiveness of CTD (Brock et al., 2017; Brock & Carter, 2013; Spooner et al., 2017; Walker & Smith, 2015), CTD challenges (Hughes et al., 2002; Oncul, 2022; Wolery & Hemmeter, 2011), the significance of hiring an individual with ASD for employment (Bennett & Dukes, 2013; Hughes et al., 2002; Roux et al., 2013; Test et al., 2009), their behaviors (Burt et al., 1991; Hendricks, 2010; Hurlbutt & Chalmers, 2002; Patterson & Rafferty, 2000; Schall & McDonough, 2010), and the most effective practices (Cook et al., 2014; CEC, 2015; Horn et al., 2020; Hughes et al., 2002; Walker et al., 2020). However, little was known about the SPED teachers' experience regarding the implementation of CTD in a job setting.

When a SPED teacher is given the right support to implement CTD effectively, IASD can achieve academically and behaviorally to maintain a job. The CEC (2015)

suggested literature that may be considered for CTD implementation. The CEC supports clear roles for teachers as well as developing common metrics and enforcing uniform licensure approaches to meet the requirements of EBP. EBP has a set of practices that have clear research evidence and have indicated positive outcomes in the lives of IASD (Steinbrenner et al., 2020). The CEC (2015) suggested that clear practice involves the context, setting, demographics, specifics of the intervention, implementation accuracy, role, qualification of the intervention agent, outcome measures, and measuring the efficacy of the intervention. I used Vygotsky's (1978) theory as a guide in answering the research question to explore the experiences of special education teachers in implementing CTD for young IASD in a job setting. This research may provide a better understanding of the teachers' experiences regarding the implementation of CTD with young adults with ASD in a job setting.

### **Literature Search Strategy**

I used numerous research databases in the Walden University Library, including CINAHL, APA PsycINFO, Journal of Behavioral Education, Health Source, Educational Research Complete, Education Resources Informational Center (ERIC), ProQuest Central, Academic Search Preview, and Sage, when conducting a thorough review of the literature. The keywords searched were *constant time delay, teacher's experience (Young Adults with Autism) evidence-based learning, best practice OR systematic instruction OR task acquisition, AND employment*. Then I searched for *special education intervention* and *special education teachers' efficacy*. First, I entered *adults with autism* in a Boolean

search, and I received 126,873 results. Then I used the same database and added *evidence-based practice* or *EBP* or *evidence-based* or *best practice* or *systematic instruction*. Here I received 3,896 results. Next, I added *teachers' experiences*, and I received 16 results. Using the same keywords, I added *employment* or *jobs* or *work* or *career*, and I received four results. I narrowed my search to full-text scholarly (peer-reviewed) articles published from 2013 to 2024.

### **Theoretical Framework**

The theoretical framework for this study is Vygotsky's (1978) SDT, in which Vygotsky suggested that the social interaction a person experiences develops their cognition. Vygotsky (1993) held the view that individuals are inherently social and need to interact and share knowledge with others in any setting to achieve success. In Vygotsky's SDT, he posited that language is the basis of learning and establishes the foundation for academic skills such as reading and writing.

### **Key Elements**

The core idea of SDT is rooted in the importance of social involvement and intellectual advancement, which includes both social interactions and cognitive progress, the acquisition of knowledge and abilities, and the notion of the zone of proximal ZPD. Central to Vygotsky's (1978) SDT is adult guidance. This research delved into the experiences of SPED teachers as they incorporate CTD in job settings and the obstacles they encounter. The interview questions covered the teachers' experiences, their challenges, and the recommendations that the teachers need to succeed.

### **Zone of Proximal Development**

The ZPD represents the mental area where a person can work with some help but not yet on their own (Brownfield & Wilkinson, 2018; Vygotsky, 1978). This area of cognitive development is the difference between what a person can achieve by themselves and what they can achieve with the help of an adult or peers (Eun, 2019). According to Vygotsky (2011), it is not appropriate to evaluate a student based on their independent achievement. He indicated that the value of learning potential is more important for the overall development of a student and can be measured by their ability to perform tasks with the assistance of an adult, through peer support or through examples set by others. Tracey and Morrow (2017) described the ZPD as the perfect level of challenge that encourages learning. Thus, teaching at the right ZPD, along with the teacher's support, is crucial for effective learning to increase a learner's capability to reach autonomy on a set skill (Tracey & Morrow, 2017; Vygotsky, 1978). Educators can use support structures or alternative teaching methods in a student's ZPD to successfully enhance a student performance level (Bondie et al., 2019; Brownfield & Wilkinson, 2018).

### **More Knowledgeable Others**

The idea of ZPD is rooted in the constructivist perspective that educators can aid students in achieving their utmost academic capabilities (Van Rijk et al., 2017). Vygotsky posited that MKOs such as a peer, teacher, parent, caregiver, or mentor are crucial for the acquisition of new knowledge (Pomerantez & Pierce, 2019). The MKO needs to be well

informed and perceptive to identify the areas that are more receptive to teaching at a particular moment and provide the necessary support and direction (Eun, 2019). Pletcher et al. (2019) suggested that once the learner's ZPD is identified, expert facilitators can employ scaffolding to guide students from their ZPD to a deeper understanding of the concept or skill. By incorporating collaborative learning opportunities, MKOs can enhance the effectiveness of CTD.

### **Scaffolding**

Scaffolding is a teaching method that involves the guidance of an adult or an expert facilitator and enhances student learning (Bondie et al., 2019; Brownfield & Wilkinson, 2018; Tomlinson, 1999; Van Rijk et al., 2017). Therefore, to help students reach their full potential during the implementation of CTD, it is advisable that teachers use scaffolding strategies based on the observation of students' progress and achievement towards the desired skill (Van Rijk et al., 2017). Adjusting teaching methods to align with the student's ZPD necessitates ongoing adjustments in the level of assistance given by the teacher, which can either offer support or pose challenges to the students based on the student's immediate need (Zucker et al., 2020). For this study, ZPD and scaffolding was used by exploring how teachers consider students' specific learning context to understand how teachers tailor CTD support to the students as they work toward independence, how teachers gradually remove the support, monitor the students' progress, and how teachers create opportunities to enhance students' social interaction for better employment outcome.

### **Sociocultural Context**

Vygotsky's (1978) sociocultural context emphasizes the role of social interaction and cultural context within a work environment. When SPED teachers incorporate sociocultural context into constant time delay, it can allow teachers to establish a nurturing environment that boosts learning, encourages teamwork, and supports the overall growth of the student (Vygotsky, 1978). Applying his idea to the implementation of CTD in job setting means integrating cultural perspective within the workplace while also creating opportunities for the employee to engage in teamwork where they can share their experiences, tools, knowledge that are applicable to the job.

### **Literature Review Related to Key Variables and/or Concepts**

#### **Autism Disorder Challenges**

Autism is a brain disorder where people have trouble with communication, have trouble interacting socially, and present with unusual behavior (Tager-Flusberg & Kasari, 2013). The way the brain works in people with ASD is explained as a problem with how the brain sends and receives signals (Divya et al., 2023; Kim et al., 2023). ASD is a brain disorder caused by genes and natural factors that affect the way the brain works (Divya et al., 2023). Studies on neurological underpinnings of ASD have suggested that the brains of IASD show abnormalities in different areas of the brain (Kim et al., 2023). Divya et al. (2023) further explained that various characteristics come together in play to affect how the brain grows and works, causing problems with social skills and leading to obsessive-compulsive disorder and limited capacity for activities. Every person with ASD has

distinct levels of intelligence. Autism is usually linked with difficulty learning, but some children with autism can learn faster than others. However, they might experience issues with communication and performing activities of daily life.

Autistic children are grouped as high-functioning or low-functioning based on their thinking and learning abilities. Children with autism who are high-functioning have IQs that are the same as or higher than average, while children with low-functioning autism have IQs that are lower than average and have significant difficulties with language and thinking (Reed, 1996). Individuals with high functioning autism are good at using a lot of words and understanding language very well but may present with difficulty with comprehending abstract language (Divya et al., 2023). Young adult ASD with high-functioning autism between the ages of 18 years and 40 are the focus of this study. A young adult is a person between the ages of 18 and 40, according to Erikson (1982). Ideally, during this stage, people develop a sense of personal identity through the exploration of different careers. Erikson argued that a delay in solidifying a career at this stage may delay career choice. Based on Erikson's research, most people reach this stage between the ages of 18 and 40 years. However, it is important to note that individuals with disability may reach this point at distinct stages, due to complicated factors. The recognition of communication and social interaction is important to be successful on the job (Rao et al., 2008). The lack of cognitive ability for effective social communication has been identified as the most important predictor impeding employment among the IASD (Jolliffe & Baron-Cohen, 1999; Munandar et al., 2020; Ryan & Marshall, 2018).

### ***Cognitive Deficits***

Cognitive deficits in executive functioning and central coherence significantly affect quality of life in individuals with ASD (Seyed-Alipour et al., 2024). In other words, IASDs are more likely to need assistance with tasks that require executive function and central coherence so they can work effectively with others.

### ***Executive Functioning***

Executive functioning refers to the way brains work to help set goals, behave purposely, plan, concentrate, and retain memory, among others (Diamond, 2013; Miyake et al., 2000). EF consists of working memory, cognitive flexibility, planning, and phonemic fluency, which play a role in communication and other skills that affect quality of life (St. John et al., 2022). Working memory allows the IASD the capacity to store and manipulate information in the brain (Jolliffe & Baron-Cohen, 1999). Cognitive flexibility helps IASD pay attention to their actions and helps IASD make decisions (Chung et al., 2014; Diamond, 2013). Planning is essential for IASD to allow them to organize and prioritize daily tasks to make it easier to do things on their own (St. John et al., 2022). Phonemic fluency is the ability to say a lot of words in a short time frame (Chung et al., 2014). EF challenges impact ASD daily lives like getting out of bed, getting dressed, managing work tasks, and social communication amongst others.

Many great tools can be used by teachers to teach students evidence-based interventions for practice that can be applied during real-life experiences (Pouliot et al., 2017). For example, if someone with ASD has trouble planning their daily tasks at work,

they can practice a script before work, and this script can be placed where it can be seen to enable the IASD plan effectively (Pouliot et al., 2017). People with ASD who struggle to keep up with a conversation can also ask the other person to speak slower, which can help them to think and respond accordingly (Pouliot et al., 2017). In the same way, the IASD who needs more time to understand details can be taught to practice asking for extra time to think. Employers expect IASD to plan, focus, remember, and multitask successfully which optimizes daily performance at work; however, an understanding of executive functioning by the teachers can be very useful for the students so that they can experience quality of life to the fullest.

### ***Central Coherence***

Central coherence is required to put information in context when reading or during interaction in social situations (Pellicano, 2010). It also helps individuals process information that requires complex comprehension. Limited connectivity in the brain may cause people with ASD to struggle with understanding complex information in context (Happe & Frith, 2006).

Comprehension and communication relate to central coherence and can influence how well ASD derives meaning from complex details (Pellicano, 2010). When IASD cannot comprehend, they are unable to make sense of information when reading and communicating with others (Jolliffe & Baron-Cohen, 1999). When an IASD cannot achieve coherence, they may not be able to make sense of complex interactions (Pellicano, 2010). Central coherence allows for the integration of different stimuli into a

coherent whole so that the IASD can see the big picture, rather than seeing bits of information that catch their attention (Jolliffe & Baron-Cohen, 1999).

Weak coherence explains IASD's inability to understand complex words and sentence structures that involve inference which may prevent IASD from comprehending during reading and social situations (Bojda et al., 2021). Employers expect IASD to communicate well, like holding conversations with clients and workers appropriately (Riches & Green, 2003). Conversely, the IASD's inability to communicate well due to neuropsychological deficits may result in job loss. For instance, a study of adults with ASD found that many IASD lost their jobs because they were not good at communicating (Müller et al., 2003).

To encourage IASD inclusion at work, people with ASD should be given opportunities to communicate with their employers and co-workers about work-related issues, as well as engage in more explicit communication (Riches & Green, 2003). However, many people who work with IASD do not know how to communicate with them in the right way. As a result, they may feel uneasy and/or lack confidence when talking with these individuals (Pouliot et al., 2017).

This discomfort in communicating with individuals with ASD may result in avoiding interactions with them or talking a lot without giving the other person a chance to engage in a meaningful conversation. While CTD alone may not address all aspects of IASD communication challenges, when implemented effectively by the SPED teachers, it can be used to improve their communication skills by modifying the students' learning

environment to reduce distractions and by giving them enough time to process complex details during conversations (Happe & Frith, 2006).

### ***Social Challenges***

Social challenges are major deterrents for young ASD in becoming hired and maintaining a job. During the job interview, young ASD may display poor grooming, display an inability to express proper facial expression, fail to recognize other people's emotions, and demonstrate poor interview skills which may be seen as socially unacceptable in a work setting (Burt et al., 1991; Hendricks, 2010; Hurlbutt & Chalmers, 2002; Patterson & Rafferty, 2001).

However, Burt et al. (1991) highlighted how social shortfall can contribute to why youthful ASD may not be given the same opportunity as another candidate without ASD. This includes the failure to maintain communication caused by challenges with communication, and lack of spontaneous speech (Chung et al., 2014). In a review of literature, there were different circumstances where an ASD person's employment was ended due to unseemly social behaviors (Burt et al., 1991; Hendricks, 2010; Hurlbutt & Chalmers, 2002; Patterson & Rafferty, 2001).

### ***Unusual Behaviors***

Youthful IASD with challenging behaviors will have difficulty keeping a job. When young IASD experience stress they may present with more problematic behaviors such as yelling, poor attention, aggression, self-injurious behavior, hyperactivity, and property destruction, which is exacerbated by ritualistic activities, phenotypic behaviors,

and rigid routines (Schall & McDonough, 2010). While CTD may not directly reduce ASD behaviors, it can promote behavior management and skills adaptation so the ASD learns ways to have a sense of control by reducing behaviors in situations that may make them feel out of control. For example, by using CTD in a job setting, students can be asked to speak more when they feel overwhelmed, rather than acting out. In addition, they could engage more with the job tasks which may help them reduce repetitive behaviors not useful for the tasks.

### **Employability Amongst Young Adults with Autism**

Employment for young ASD is a major concern, as it can be difficult for them to find jobs due to their disabilities (Allen et al., 2012). This is a problem that needs further attention and support from society. It is known that work engagement during young adulthood can lead to future job opportunities (Taylor & Seltzer, 2011).

However, teacher education and professional development are still lacking in preparing teachers to adequately prepare students in academic skills that will expose the students to more functional and applied content (Bradley, 2022; Nougaret et al., 2005; Rakap, 2019). As a result, young people with ASD have fewer job opportunities and face social and psychological challenges (Hurlbutt & Chalmers, 2002).

Thus, employment needs for IASD must be taken more seriously, and taking this issue more seriously will require special attention from the teacher to proactively focus on teaching skills that will increase the engagement of the students (Taylor & Seltzer, 2011). It is confirmed that vocational engagement reduces autism symptoms and

increases adaptive functioning (Taylor et al., 2014). IASD can benefit from prompting to increase engagement by calling their attention to relevant details that they may be missing during learning (Wang et al., 2007). Furthermore, it has been demonstrated that higher functional ability, independence in living, self-care, fewer ASD symptoms and better social and communicative skills are linked with employment in IASD (Carter et al., 2012; Chiang et al., 2013; Holwerda et al., 2013; Roux et al., 2013; Shattuck et al., 2012; Taylor & Seltzer, 2011).

### **Autism Supportive Employment Services and Transitional Planning**

Rammler and Ouimette (2016) indicated that it is important to understand what people with autism need to succeed as they move from high school to a job. When we understand what students with disabilities need to learn effectively, they will receive more support to help them achieve their goals post high school. The study by Rammler & Ouimette, 2016 further necessitates that employment planners for young IASD are to ensure that the individual can demonstrate the core requirement. These include independently completing Activities of daily living (ADLs), being included in the advancement of their individualized education program, and participating in or facilitating their planning and placement team meetings. Also, IASD should show that they are responsible for taking care of themselves and doing daily activities. They should be able to explain how their disability affects them and talk about their strengths, needs, preferences, and interests. They must be given what they need to participate fully in school and work. They should also understand their rights and responsibilities under

disability laws like the Individuals with Disabilities Education Act (IDEA, 2004).

Individuals with Disabilities Education Act also suggested that the skill level of individuals with ASD should align with that of those at the employment readiness level. This ensures that they can access suitable employment that meets their unique needs and also demonstrates their skills to access appropriate postsecondary education, training or lifelong learning opportunities that cater to their individual requirements. The Individuals with Disabilities Education Act also confirms that the IASD should be able to demonstrate appropriate social interactions and skills to maintain meaningful relationships as well as to engage in community activities. In addition to the core requirement, the candidate should have enough support from state vocational rehabilitation services and career advancement throughout their work life. Job readiness should begin in late elementary years with a job profile and by late junior high or early senior high years, the student should have become highly prepared by a vocational counselor who has completed a thorough specialized/ standard interest assessment and aptitude test, job analysis, and job site evaluations (Rammler & Ouimette, 2016).

Transitional planning agencies for IASD has been recognized by a few agencies, organizations, and federal agencies to promote individualized and holistic services starting at age 12 through a four-step individualized supportive employment model (a) the advancement of a job profile and appraisal, (b) directing the work improvement and career look, (c) conducting job site training and (d) designing long-term support to promote job retention (Cheak-Zamora et al., 2015). Job readiness planning plays a crucial

role in preparing individuals for employment and engagement in CTD intervention. This process aids in sustaining employment and securing a promising future as an adult (Reed, 1996).

### **The Role of the Teachers in the Delivery of Services**

Teachers who teach adult learners are tasked with the responsibility of teaching basic reading and writing skills in addition to exposing students to more applied content areas, which include instructing and assisting with vocational training and transition planning (Wasburn-Moses, 2005). Yet teacher education and professional development are still lacking in preparing teachers for these roles (Bradley, 2022; Nougaret et al., 2005; Rakap, 2019). The lack of role clarity may be a contributing factor to special education teacher shortages in the field, which may impact the way the teachers are teaching IASD (Wasburn-Moses, 2005). Even though they are expected to provide interventions and assessments that are appropriate to each student, teachers' thoughts on their experience are being overlooked in research, to determine if teaching strategies are working (Darling-Hammond, 2009).

Research indicates that special education teachers implementing systematic instruction are required to accurately assess the students, manage instructional time, accurately present prompts, and procedures, provide performance feedback, and report accurate data (Wolery et al., 1992).

However, teachers are facing difficulties applying acquired knowledge in practice (Rakap, 2017, 2019). Special education teachers are expected to meet the education and

training requirements for their position, but the literature suggests that special education teachers and professionals who have the experience, training, and education have challenges in implementing CTD strategies (Nougaret et al., 2005). In addition, there is a lack of research on how to train teachers to consistently use the CTD strategy (Oncul, 2022). When teachers can implement instructional intervention properly, they are more likely to deal with and overcome learning deficits impacting IASD (Walker et al., 2020).

Lyon et al. (2023) identified ways teachers can implement systematic instruction for better student outcome:

- Addresses varied students' complex learning needs.
- Providing systematic instruction using clearly defined methods of prompting and feedback.
- Providing initial training, performance feedback, self-monitoring, and coaching.
- Willingness to offer support and build a positive student-teacher relationship.
- Provide effective useful resources that extend beyond what the program offers.
- Create a schedule for monitoring students' progress.

### ***Constant Time Delay Process***

The success of CTD is well-known in research (Akcin, 2013; Appelman et al., n.d.; Bozkurt & Gursel, 2005; Browder et al., 2017; Dogoe et al., 2011; Goldsmith et al., 2007; Hua et al., 2013; Odluyurt, 2011; Pennington et al., 2018; Swain et al., 2015).

Despite the success of CTD strategy, Hill et al. (2014) and Kretlow and Bartholomew (2010) argued that how well teachers carry out instruction and intervention is very important for SPED students to succeed. In teaching young IASD, the teacher uses systematic instruction and repetition to guide the student to perform a given task, which is critical to positive employment outcomes (Bennett & Dukes, 2013). Several prompting strategies are used in teaching young adults with ASD (Swain et al., 2015).

They are response prompting, graduated guidance, progressive time delay, constant time delay (CTD), simultaneous prompting, and system of least prompts, (Swain et al., 2015). CTD strategy is more effective than other strategies and uses an EBP, that focuses on fading the use of prompts during instructional activities while delivering reinforcement until the learner master's the skills" (Neitzel, 2009, p. 1). "When implementing CTD, there is no delay between the instruction and the prompt, and a fixed amount of time is used (usually 3,4,5 seconds)" (Neitzel, 2009, p. 1). Then, these trials are used until the learner gains mastery. "When preparing for the intervention, the teachers and other practitioners operationalize the target behavior/skills that they want the learner to learn" (Neitzel, 2009, p. 2).

Then, the teachers operationalize the target skill/behavior by defining the skill and behavior in observable terms, so they can easily identify correct and incorrect responses. Then the teachers identify the target skill behavior as either a discrete task or a chained task. "A discrete task involves a short prompt and short response such as pointing to a picture or greeting a friend; However, a chained task requires a series of steps to

complete a complex skill” (Neitzel, 2009, p. 3).

Before the intervention, teachers and other practitioners also determine that the student has the prerequisite skills needed to participate in learning. “Some prerequisite skills are responding to instructional prompts, following instructions, etc., and then the teacher determines if CTD is right for the student based on the learners’ characteristics, how the learner can acquire the skills, and task difficulty” (Neitzel, 2009 p. 5).

“Furthermore, If the target stimulus (i.e., the skill the learner is expected to learn), has never been taught then the teacher uses both CTD and progressive time delay (PTD) during the didactic phase of learning” (Neitzel, 2009 p. 2).

PTD is more flexible in timing and gives the learner more time to learn the prompt, unlike CTD which uses a fixed time for the individual to respond after the target is presented with the instruction (Kurt, 2012; Tekin Iftar et al., 2011; Wolery et al., 1988). The CTD strategy can be embedded into different activities (e.g., answering questions, pointing to numerals, washing hands, and cooking). “During CTD implementation, it is the teacher’s responsibility to determine the time during the day that the target skill behavior can be taught and how many trials were implemented during instruction” (Neitzel, 2009, p. 8-9). For example, in a discrete task, A teacher says, “David,” David looks at the teacher. She presents a flash card with the word, “stop” on it (target stimulus) and says, “What is this, David”? “While pointing at the flash card” (Neitzel, 2009, p. 10).

The teacher’s behavior used to secure attention was saying the child’s name. The

target stimulus is the word “stop.” The cue or task direction in this example is the teacher saying, “What is this, David?” After securing the attention, the teacher presents the target stimulus and delivers the cue/task direction, then the teacher immediately delivers the controlling prompt. If the learner’s response is correct, the teacher immediately delivers the reinforcement (e.g., praise, tangibles, break).

If the learner’s response is incorrect or the learner does not respond, then the teacher ignores the response and goes on to the next trial. With a chained task, when an error occurs, the teacher may have to correct the incorrect step before moving on to the next step. “The delay trials involve inserting a response interval after securing the learners’ attention, presenting the target stimulus, and delivering the cue/task direction” (Neitzel, 2009, p. 10-12). In addition, if learners do not respond at the end of the response interval, teachers/practitioners then deliver a controlling prompt to help learners use target skills behavior correctly. These sessions continue for the remainder of the instruction until the learner achieves the criterion.

According to Neitzel (2009, p. 13), “the intervention procedure is a key component of the time delay procedure which is accomplished by data collection.” During a (0) second session and (b) the delay-trial sessions, the expected pattern during 0-second sessions is to have 100% prompted correct responses. When there is a correct response, “the prompted responses are meant to decrease during delayed trials, and it is expected that the percentage of unprompted correct responses should increase” (Neitzel, 2009, p. 13). The key element in CTD is to monitor a learner’s progress so that the wait

time can be monitored and adjusted as the learner becomes proficient during learning activities. This procedure is useful as it allows teachers and other school administrators to adjust the wait time as the learner master's the skills (Kurt & Tekin-Ifar, 2008).

### **Challenges of Constant Time Delay Prompting Strategy**

CTD uses systematic instruction that has been proven in research to support individuals with autism to demonstrate life skills, community skills, and academic skills in the classroom, vocational, and community settings in an effort that the student may eventually be able to apply the skills learned independently without the teacher's guidance (Browder et al., 2009; Horn et al., 2020; Riesen et al., 2003; Walker, 2008; Zisimopoulos et al., 2011).

According to Hughes et al. (2002) and Wolery and Hemmeter (2011), special education teachers are not implementing CTD correctly in the classroom and several reasons were responsible for these deficiencies such as avoiding direct and systematic instruction, lack of adequate support for teachers, lack of teachers' skills, poor in-service preparation and ongoing training, and lack of creativity in classroom schedules.

The previous findings support Oncul (2022), who further stated that when prompting is used, they are not used appropriately and systematically. CTD used embedding instruction in natural settings to teach multiple skills, but clear guidance for SPED teachers to use embedding strategies in different activities and settings does not exist (Nougaret et al., 2005). For example, Daugherty et al. (2001) argue that attention can be secured, and instructional procedure embedded at other times, but these activities

are not mutually exclusive, because the teacher simultaneously embeds the instructions into a variety of activities at different intervals, but research is needed on what cues teachers require to embed trials. Daugherty et al. (2001) explained that the frequency to which the trials should be inserted and the type of behaviors that should be simultaneously inserted during the different scenarios are to be considered too. In this capacity, it is unclear if single or multiple implementers of embedding using the same instructional procedure for the same behavior is reasonable.

Previous studies have reported very little about the treatment integrity of CTD in the classroom, vocational, and community settings in preparing teachers to implement CTD correctly (Browder & Shear, 1996; Wolery et al., 1997). In addition, most of the research on CTD is typically conducted in educational, vocational and community environments where keeping a job is not the main goal (Bennett & Dukes, 2013; Bozkurt & Gursel, 2005; Riesen et al., 2003; Swain et al., 2015). Nonetheless, only Hughes et al. (2002) and Horn et al. (2020) reported high accuracy in their study.

Although, Hughes et al. (2002) did not mention employment in their study, but they reported that there was no confidence in the long-term mastery of the word learned and there was also uncertainty about the number of trials to be used and how many sessions are required to reach the criterion. Despite the voluminous CTD research in the community, classroom, vocational, and community settings, Horn et al. (2020), is the only study that considered the job setting in which high accuracy was reported.

To implement CTD strategy effectively, teachers require ongoing training that

consists of coaching, feedback, intervention integrity and outcome, and a standard guideline that instructors can use as a guide to ensure that the strategy is being implemented appropriately according to EBP (CEC, 2015; Oncul, 2022; Wolery & Hemmeter, 2011). Considering the Special education teachers' challenges to apply CTD appropriately which can potentially impact positive job outcomes for the Young IASD and the lack of CTD implementation in a job setting, I used a qualitative study to explore the experiences of SPED teachers' implementation of CTD in a job setting to support the IASD employment outcome.

### **Summary and Conclusions**

This literature review discussed extensively the teachers' CTD implementation with an emphasis on their instructional strategies, instructional practices, processes, instructional techniques, and best practices that can be used to understand the teachers' experiences in applying CTD to improve IASD employment outcomes. In the literature, CTD supports IASD with moderate cognitive challenges improve communication skills, social skills, academic skills, and life skills in a job setting (Horn et al., 2020). However, the process by which the successful outcome is achieved is still unclear in all settings (Daugherty et al., 2001; Hughes et al., 2002; Oncul, 2022; Wolery & Hemmeter, 2011).

Despite the large research that mentions the success of CTD in classrooms, vocational training, and other community settings, there are very few studies that examine the process by which they arrive at a successful outcome (Oncul, 2022; Wolery & Hemmeter, 2011). There is only one study that I came across that examined

employment acquisition in a job setting where the students were hired to work, and it was mentioned that the instructors implemented the procedure with accuracy.

The literature touches on special education teachers' CTD implementation, instructional strategies, instructional practices, process, CTD effectiveness, instructional techniques, the importance of IASD employment, IASD deficits, and best practices that might be useful for CTD strategy, but we do not know the experience of the special education teachers implementing CTD to improve employment in a job setting. As a result, this study filled the current gap in the literature by gaining more insight into special education teachers' experience supporting IASD during CTD implementation to improve employment in a job setting. In Chapter 3, I will discuss the role of the researcher, methodology used for the research study, participant selection, the data instrument that was used throughout the study, procedure for the recruitment, participation, data collection, data analysis plan, trustworthiness and ethical procedures.

### Chapter 3: Research Method

The purpose of this basic qualitative study was to explore the experience of special education teachers implementing a CTD strategy for young adults with autism in an employment job setting. I used semi-structured interviews to explore the experience of SPED teachers implementing CTD strategy for young adult students with autism. In Chapter 3, I discuss the research method, the rationale, and the role of the researcher. I also provide additional knowledge that addresses participant selection, instrumentation, validity, reliability, data collection, data analysis plan, and ethical considerations.

#### **Research Design and Rationale**

The research question focused on SPED teachers who have the experience implementing a CTD strategy for young individuals with ASD in a job setting: What are the experiences of SPED teachers implementing CTD strategy for young ASD in a job setting? Even though SPED teachers have reported implementing CTD in various settings, there is limited implementation of CTD in a job setting (Horn et al., 2020). ZPD coupled with MKOs is the ideal way to increase learners' capability to reach autonomy when working on a targeted skill (Tracey & Morrow, 2017; Vygotsky, 1978). As such, teachers may implement scaffolding or other instructional strategies within a learner's ZPD to effectively improve the student's outcome.

The central purpose of this study was to understand the experience of special education teachers implementing a CTD strategy for young adults with autism in a job

setting. I conducted a qualitative study to answer the research question. Qualitative researchers focus on understanding the perspectives of people who are directly connected to the phenomenon being investigated (Creswell & Creswell, 2018). They also focus on how people interpret their experiences, how they construct their worlds, and what meaning they attribute to their experiences (Donnelly et al., 2013). Data collection for this qualitative research consisted of in-depth interviews that allowed me to obtain rich and thick descriptions of the meaning that research participants attributed to their experiences (Creswell & Creswell, 2018). Initially, I thought about using phenomenology as a methodology, but phenomenology focuses on the lived experience who share similar experience, and this study did not explore a specific phenomenon (Burkholder et al., 2016; Creswell & Creswell, 2018). This study focused on how people interpret their experiences, how they construct their worlds, and the meaning they attribute to their experiences, so a basic qualitative study would be appropriate (Creswell & Creswell, 2018). Basic qualitative research is based on understanding the way people view their approach to life and experiences (Clandinin & Connely, 2000). I conducted a basic qualitative study consisting of interviews with open-ended questions. The interviews explored how SPED teachers view their experience in the implementation of CTD for young individuals with ASD. By using a qualitative design, I was able to answer my research question (Creswell & Creswell, 2018).

### **Role of the Researcher**

In my role as a researcher, I was aware of how my experiences and assumptions

may influence the interpretation of the results. I took responsibility by disclosing any biases that may influence the result (Ravitch & Carl, 2021). A method to achieve this is called researcher reflexivity (Ravitch & Carl, 2016, p. 188). Reflexivity requires the researcher to document in notes, memos, or journals their self-critical analysis of biases, their role and responses to the research process, and any adjustment made to the study based upon ongoing analysis (Burkholder et al., 2016). This process allowed me to examine my subjectivity that may have influenced my research. I kept a reflexive journal in which I wrote memos, noting down potential biases and assumptions. Currently, I am employed working with adults with severe mental illnesses, but my current job does not have any connection with my current research.

## **Methodology**

### **Participant Selection**

The study participants consisted of seven SPED teachers who have the job title of a direct support professional, behavior technician, behavior analyst, behavior analyst assistant, registered behavior technician, special education teachers or a job coach from a job training program for young adults with ASD, who have experience implementing CTD with young IASD adults between ages 18 and 40, and who are currently receiving employment training in a job setting. The criteria for participation included (a) have taught young IASD students, (b) have met the education and experience criteria to work with IASD, and (c) have self-reported experience in implementing CTD in both classroom and vocational programs with young adults with ASD. The sampling strategy

was purposeful sampling. Researchers often use purposeful sampling to select participants who can provide information that can answer the research question in focus (Merriam & Tisdell, 2015; Ravitch & Carl, 2021). The participants were selected according to the criteria to ensure they meet the requirements.

### **Instrumentation**

I conducted a face-to-face, semi-structured interviews during a time that was suitable for the special education teachers. With the permission of the participants, I used audio recording. I used a guide to help me with the data collection. This provided me with accurate responses useful for addressing the research question (Creswell, 2014). I used an interview protocol (see Appendix A) that was developed from the research question, literature, and theoretical framework related to the implementation of CTD. The interview questions covered questions related to the teachers experience implementing CTD, CTD process, assessment, opportunities for social interaction, barriers and challenges. To improve the clarity of my study, I used a peer reviewer to read the interview protocol before administering the questions.

### **Recruitment and Data Collection Procedures**

My goal was to recruit a minimum of ten special education (SPED) teachers or more, contingent upon reaching data saturation. Saturation occurs when data analysis does not show up with new themes, but instead establishes already existing data (Burkholder et al., 2016). Upon obtaining approval from Walden University's Institutional Review Board (IRB; approval no. 02-14-25-1021725), I initiated the

recruitment process by visiting various centers that provide employment services for young IASD utilizing the CTD strategy. This approach is suitable for the study as it will enable the collection of diverse insights from SPED professionals who provide CTD strategy to young IASD within job settings.

Upon arrival at each center, I introduced myself to the front desk administrator and explain the purpose of my visit. Subsequently, I distributed recruitment flyers (see Appendix B) and inquire whether I may speak with the center's director. If granted permission, I introduced myself to the director, explain the study's purpose, and provide the recruitment flyers. Additionally, I informed the director that further details regarding the study was communicated via email once an individual expresses interest in participation. The follow-up email will include (a) participant selection criteria (see Appendix C) and (b) the informed consent form (see Appendix D). However, if a meeting with the director is not permitted, I left the flyers with the front desk administrator and request that they forward the information to the director via email. I also requested the director's contact information, including their email and phone number.

Once I obtained the director's contact details, I sent an email containing the recruitment flyer. Upon receiving the director's approval to invite their SPED teachers to participate in the study, I requested that the director either distribute the flyers to the teachers or provide me with a mailing list of eligible teachers. Subsequently, I sent the recruitment flyers (see Appendix B) via email to the teachers, outlining the study's objectives and inviting their participation. When a teacher expresses interest by

responding to my email, I replied with a formal acknowledgment of their interest and attach both the participant selection criteria (see Appendix C) and the informed consent form. Within this email, I requested that interested participants reply with the statement, “I consent,” as an indication of their willingness to participate. The consent form will ensure that participants comprehend the study’s purpose, potential risks, and their rights before agreeing to participate. Furthermore, participants were informed about the procedures for data collection, storage, confidentiality, and security. I emphasized that participants’ identities and personal information will not be disclosed in any reports, publications, or presentations.

Upon receiving both the signed consent form and an email response confirming consent, I coordinated with the participants to schedule a semi-structured interview. Participants were given the option to select a face-to-face meeting, Zoom, or Microsoft Teams as their preferred mode of interview. The interviews will last approximately 45 to 60 minutes. During the interview, I ensured that participants fully understand the interview’s purpose and clarify any aspects that may be unclear. Additionally, I reinforced that participants retain the right to withdraw from the study at any time.

To facilitate open communication, I allowed participants to ask questions before and during the interview. Each interview was recorded using an iPad voice memo recorder, and I employed a predetermined set of questions designed to explore research questions related to the development and implementation of the CTD strategy to support high-functioning IASD individuals with moderate cognitive challenges in employment

settings. The semi-structured interview format will allow for probing questions, enabling me to clarify responses and ensure an accurate interpretation of participant perspectives. Given the importance of minimizing misinterpretation, I employed narrative inquiry techniques, as outlined by Creswell and Poth (2016), by taking notes during the interview to document my reflections, thoughts, and observations. To further mitigate misinterpretation, I conducted a post-interview debriefing session. Finally, I formally acknowledged and express gratitude to each participant for their valuable contributions to the study.

### **Data Analysis Plan**

Data analysis occurred directly following each participant interview. The process of gathering data is intentional and should be carried out at different stages, not just through a single comprehensive analysis (Ravitch & Carl, 2021). Hence, I adopted a basic qualitative methodological approach to examine the data following each interview. Creswell and Poth (2016) suggested that qualitative researchers need to consistently verify the accuracy of their data transcription to ensure the data interpretation is reliable. I explored the data by listening to the audio interview several times before transcription. Corbin and Strauss (2015) recommend that the next step after data collection is transcription, organizing and coding. Per Creswell and Creswell (2018), as I listen to the recording, I wrote down notes and highlight valuable information on the Word document on my iPad. I then used the Qualitative research software (QSR), the NVivo program to transcribe the audio recording. The software will allow me to organize, transcribe, store

the data and identify subsequent codes. Through this software I can organize my data and look for themes as they pertain to the theoretical framework in a more organized and efficient way which can ultimately result in a more reliable and insightful conclusion. Additionally, I maintained a reflective journal for recording data analysis and synthesis through my password protected iPad.

### **Evidence of Trustworthiness**

Trustworthiness in qualitative research refers to the degree of credibility, transferability, dependability and conformability (Creswell, 2014). Researchers maintain trustworthiness by using different strategies (Ravitch & Carl, 2016). I considered several strategies for this basic qualitative study to verify trustworthiness. In addition, using Vygotsky's theory in the context of ZPD (Vygotsky, 1978), could provide credible insights into how SPED teachers support IASD during CTD teaching implementation in the job settings to better support IASD employment outcomes.

### **Credibility**

Merriam and Tisdell (2015) indicated that researchers must ensure credibility and reliability of research. Credibility was maintained by using reflexivity and member checking. Using reflexivity to ensure thoughtful self-awareness of one's experience minimizes potential for biases (Ravitch & Carl, 2016). I achieved this by relying solely on the data collected and not allowing my own biases to interfere with the study. Member checking involves checking back with the study participants to see if they have any comments or concerns about the data interpretation (Ravitch & Carl, 2016). During

member checking all study participants will have an opportunity to confirm the accuracy of the interpretations of the collected data and make revisions necessary. Patton (2015) defined credibility as addressing the issue of the researcher ensuring there is consistency in the respondent's perspective of their life experiences with the researcher's interpretation and portrayal of those experiences "(p. 485). To enhance credibility in the study, certain strategies such as triangulation, active engagement in the research process, and evaluation of the process was conducted and reviewed by my professors. I incorporated feedback from my professors and experts to ensure that my research questions were adequately addressed by my data collection.

### **Transferability**

Transferability refers to the findings of similarities within a study that can be transferred to a different context (Ravitch & Carl, 2016). Transferability was used in the study by providing in-depth details about the research setting, background and the individual CTD experience. This will provide the necessary background for readers to recognize similarities in another context that can be applied to other similar research areas (Merriam & Grenier, 2019).

### **Dependability**

Dependability refers to the consistency and reliability of research (Merriam & Tisdell, 2015). I utilized member checking to strengthen the dependability of the research findings. Member checking supports dependability, and it is useful in qualitative research to assist the researcher in ensuring the validity of the participants' experience (Creswell

& Poth, 2016; Ravitch & Carl, 2021). I checked back with the participants after the interview to see if they have any comments or concerns about the data interpretation.

Burkholder et al. (2016) recommend that member checking should be used to allow the participants to ensure the accuracy of the identified theme in the interview. Member checking allows the researcher to ensure that the identified interpretation and analysis aligns with the participants' interview and deepen responses to enrich in-depth knowledge, Ravitch and Carl, 2021. This can be analyzed by taking the final analysis to the participants to ensure that there are no incorrect interpretations (Creswell, 2014). I ensured that biases are reduced by sending the findings to each participant via email and double checking with them if my findings reflect what they stated in the interview. I also disclosed my final findings so that the participants can examine them, to ensure that I have captured all their experiences and interpreted them correctly. I stopped analyzing data when I reached a saturation point when no new information is forthcoming (Patton, 2015).

Saturation occurs when data analysis does not show up with new themes, but instead establishes already existing data (Burkholder et al., 2016). To establish reliability, an intercoder agreement were used to ensure that I arrived at the same finding when coding the same content. I then used intercoder agreement to develop a list of preliminary codes, which was compared to assess consistency. The coding of participants' data was handled carefully, and I used Creswell and Creswell (2018 p. 264-265), as a guide to ensure the reliability of my study.

**Conformity**

Conformity confirms that the interpretation of the collected data is not biased in a way that the research is not influenced by the researchers' personal views but rather is based solely on the data (Korstjens & Moser, 2018). I employed conformity by using member checking and reflexivity to make sure that the research results are unbiased. Member checking is the process of checking with the participants to see if they have any feedback or issues with how the data was interpreted (Ravitch & Carl, 2016). Reflexivity refers to the researcher being aware of their thoughts and the way they reason (Ravitch & Carl, 2016, p.188). I achieved reflexivity by making sure the research is unbiased.

**Ethical Procedures**

To protect the rights of those participants involved in the study, I only proceeded once my study has been approved by the IRB at Walden University. I then secured consent from the job training program where the interviews will take place. Participants were made aware of the study's objectives, its details, and that their involvement is optional, with the understanding that they can leave the study at any point. I protected the privacy of all participants and maintain the confidentiality of collected data by assigning participants number identifiers that cannot be used to identify them (Yin, 2016). When a participant declines to take part or decides to leave the study, I chose the subsequent participant who showed interest. I followed the same methods for informing and arranging meetings (Creswell & Poth, 2016). Data Information will be erased after five years once the study is finished. All digital information will be deleted from my

computer, IPAD and physical copies will be shredded. I made sure that all messages to the participants are sent through private emails and I was the only one with access to data in this research.

### **Limitations**

The limitations that I foresaw in my study had to do with the varying degrees of teaching experience that I came across during the interview and how they may impact participant responses to the interview questions. Teachers with many years of experience and skills may have provided more information regarding implementing the strategy as opposed to teachers with minimal experience. I also foresaw that I may not have had access to as many teachers who have experience and skills because the CTD implementation in a job training program is still in its infancy.

### **Summary**

In chapter 3, I discussed the role of the researcher, methodology used for the research study, participant selection, the data instrument that was used throughout the study, procedure for the recruitment, participation, data collection, data analysis plan, trustworthiness and ethical procedures. My research method is Basic qualitative study that will focus on the teachers' experience implementing constant time delay strategy to youths with ASD. The framework being considered will help young adults to understand what was done or not to ensure proper implementation of constant time delay strategy to young adults in a job setting. I also discussed the protocol for applying ethical procedure associated with the research study. In Chapter 4, I will discuss the data analysis and

provide the results of the study.

## Chapter 4: Results

The purpose of this basic qualitative study was to explore the experiences of SPED professionals implementing the CTD strategy for young adults with ASD, aged 18 to 40, in employment settings. The goal was to understand how these professionals applied CTD in real-world job settings to support the transfer of classroom-based skills to the workplace, answering the following research question: What are the experiences of SPED teachers implementing CTD strategy for young ASD in a job setting?

Data were collected from seven participants through semi-structured interviews consisting of 11 open-ended questions. These questions explored participants' overall experience, their use of CTD, the implementation process, methods of assessment, opportunities for social interaction, and perceived barriers and challenges. Thematic analysis was used to code and categorize the interview transcripts, resulting in key themes aligned with the ZPD and the theoretical framework. This chapter includes a description of the research setting, an overview of the data collection and analysis procedures, a discussion of trustworthiness, and a presentation of the study's findings.

### **Setting**

This basic qualitative study included seven participants with varying professional roles and educational backgrounds, all of whom had direct CTD experience working with young IASD in an employment setting. Participants held positions such as registered behavior technicians (RBTs), board-certified behavior analysts (BCBAs), board-certified

assistant behavior analyst (BCaBA), and one direct support professional. They were employed in a range of settings, including two working in autism clinics, three working in a coffee shop, one working at a convenience store, and one working in a residential setting with adults actively employed. All participants had at least a minimum of 2 years of teaching experience implementing the CTD strategy and met role-specific qualifications for working with individuals with autism. Most were credentialed through the Behavior Analyst Certification Board (BACB), except for one direct care professional who received on-the-job training. Two participants taught in autism clinics where token reinforcement was used to simulate monetary exchanges, four provided instructions in employment settings where participants received paid on-the-job training, and one provided direct care instruction in a home environment to employed adults with autism.

### **Participant Demographics**

Participants varied in educational attainment and gender. One participant held a high school diploma, two held a bachelor's degree, and four possessed a master's degree (see Table 1). Training requirements differed by education level; those with a high school diploma completed 40 hours of RBT training and on-the-job training and passed the registered behavior technician certification exam. Bachelor's degree holders completed a verified course sequence, 1,000–1,300 hours of supervision, and passed the certification exam. Master's degree holders completed similar requirements, with 1,500–2,000 supervision hours. Among the seven participants, six identified as female and one as male. Participants' racial identities included one Black male, two White females, one

Hispanic female, and three Black females. Each participant provided informed consent, agreed to audio recording of their interviews, and was assigned a unique alphanumeric code (P1–P7), which was used consistently throughout the data collection and analysis.

**Table 1**

*Demographics*

| Participants | Highest Degree | Years of Experience in Classroom setting | Years of Experience in a Job setting                              | Years of Implementing CTD |
|--------------|----------------|--|---|---------------------------|
| P-1          | BSc., RBT      | 2  | 2   | 2                         |
| P-2          | MSc., BCBA     | 3  | Gained exposure during her classroom experience- Was not specific | 3                         |
| P-3          | MSc., BCBA     | 2  | 8   | 8                         |
| P-4          | MSc., BCABA    | 3  | 0   | 3                         |
| P-5          | HS., RBT       | 3  | 3   | 3                         |
| P-6          | MA., BCBA      | 2  | 3   | 3                         |
| P-7          | BSc., DSP      | 2  | 6   | 6                         |

*Note.* “0” indicates No experience. Educational levels and certifications are abbreviated as follows: RBT = Registered Behavior Technician, Direct Support Professional = DSP, BCBA= Board Certified Behavior Analyst, BCaBA = Board Certified Assistant Behavior Analyst. BSc= Bachelor of Science, MSc= Master of Science, MA= Master of Arts, HS= High school diploma.

**Data Collection**

For this basic qualitative study, purposeful sampling was used to select seven participants who voluntarily contributed data to address the research question through one-on-one single, semi-structured interviews. To participate in the study, individuals were required to (a) have experience teaching IASD, (b) meet the educational and professional criteria for working with this population, and (c) self-report experience

implementing CTD procedures in both classroom and vocational settings.

While the initial research design proposed interviewing 10 or more professionals, data collection concluded earlier than anticipated due to the attainment of thematic saturation. As the analysis progressed, it became apparent that the responses began to yield recurring themes, patterns, and categories. No new codes or significant insights emerged from the latter interviews, signaling that additional data would likely be redundant. This decision to conclude data collection earlier than anticipated aligns well with qualitative research principles, which emphasize that data collection may cease once saturation is reached when no new information or themes are observed in the data (Guest et al., 2006).

The semi-structured interviews were conducted via Teams, lasting between 30 and 60 minutes and scheduled outside of school hours at the participants' convenience. The interview emphasized open-ended questions, which allowed for clarifying and probing follow-up questions to gather richer, more detailed responses. Participants were instructed not to disclose their identities during recording to protect confidentiality.

All interviews were transcribed using Microsoft Teams, and I carefully reviewed each transcript while listening to the recordings and making necessary corrections to ensure accuracy. Member checking was used to validate the data and participants were given the opportunity to review and adjust their transcripts to ensure their statements were accurately represented. Creswell (1998) emphasized that member checking strengthens the validity of qualitative research by confirming findings with the original

sources. All data including recordings and transcripts were stored on a password-protected laptop. Participant selection and data collection began only after receipt of Walden IRB approval. Data collection proceeded as planned and no unexpected issues arose. Once transcription and member checking were completed, the data were organized for analysis.

### **Discrepant Cases**

In qualitative research, discrepant cases are important for challenging, expanding, or refining emergent themes (Morse, 2018; Tracy, 2020). Although many participants confirmed the applicability of CTD for promoting employment skills in young adults, P2 noted, “I do have limited experience working with young adults in a vocational setting.” P2 worked primarily in an autism clinic with children but reported some exposure to using CTD with young adults, specifically through reinforcement systems that mimicked monetary rewards. While P2 experience with adults was not extensive, P2 met the study’s inclusion criteria as a BCBA with direct experience implementing CTD and as someone on the spectrum. P2’s unique perspective provided a deeper, more personal framing of CTD and not just as a behavioral strategy, but as a tool for fostering autonomy and reducing prompt dependency, based on the participant experience.

Similarly, P4, whose professional background is entirely with children, met the inclusion criteria through substantial experience using CTD. P4 reflected on how the foundational skills taught in classroom environments could be applied to adult vocational contexts, by demonstrating CTD’s adaptability across age groups and settings. Rather

than presenting contradictory evidence, these cases enriched the thematic analysis by illustrating the flexible, individualized application of CTD. Their insights aligned with the study's theoretical framework grounded in Vygotsky's ZPD by reinforcing the importance of scaffolding instruction and tailoring the support to meet the developmental needs of the individual on the spectrum. This connection underscores the value of CTD not only as a procedural strategy but also as a mechanism for supporting independence and workplace readiness in individuals with autism. Furthermore, it highlights opportunities for enhancing professional training and promoting effective transitions from educational to employment settings.

### **Data Analysis**

This study used thematic analysis to explore the experiences of SPED professionals implementing CTD strategies with young adults with autism in an employment setting. Braun and Clarke's (2006) six-phase framework guided the analysis and NVivo 15 software were used for data organization and coding. Merriam and Grenier's (2019) recommendations on interpreting qualitative data informed the process.

#### **Phase 1: Familiarization with the Data**

The analysis process began with the transcription of interview data. Verbatim transcripts were generated using Microsoft Teams, and each participant was assigned a unique identifier (P1 to P7) to ensure confidentiality. Following transcription, participants were emailed a copy of their respective transcripts to verify accuracy and offer clarifications, consistent with the member checking process recommended by Ravitch

and Carl (2016). This initial review provided early impressions and informed me about the development of a preliminary coding framework.

### **Phase 2: Generating Initial Codes in NVivo**

I used NVivo 15 to organize and code my interview transcripts. Assigning unique identifiers to each participant (P1–P7), allowed me to associate coded content with specific individuals. This setup enabled NVivo to automatically track which participant contributed each piece of coded data, monitor how frequently each node appeared across participants, and facilitate effective cross-case comparisons. I then created a structured codebook using a deductive approach informed by the interview questions. These nodes served as the foundational coding structure for subsequent data analysis in NVivo 15. I generated parent nodes to represent broad topical areas (e.g., education and training, experience and implementation context, assessment and instructional practices, social development and support, and barriers and recommendations). Nested within these parent nodes were child nodes representing more specific subcategories like pre-implementation education, learning CTD, on-the-job training, experience with CTD, using CTD in job settings, CTD teaching process, assessing readiness and progress, promoting social interaction, facilitating progress, challenges in Implementation, improvement recommendation. For example, when participants responded to the question “Describe the process by which you learned to use CTD.” I coded their responses under the child node Learning CTD, which is located under the parent node education and training. Similarly, when participants discussed obstacles to implementation, their responses were

coded under challenges in implementation, nested within the parent node barriers and recommendations. NVivo facilitated this process by enabling me to systematically organize and visualize the data, monitor code frequency, and ensure consistency in the application of codes across all participant cases.

### **Phase 3: Searching for Themes**

In Phase 3, I organized the coded data into preliminary categories by grouping related nodes. These categories were then examined to identify broader themes that captured patterned meaning across participants. For instance, the codes learning CTD and on-the-job training were grouped under the category (parent node), education and training, which informed the theme training and preparation. Similarly, codes such as using CTD in job settings and CTD teaching process were categorized under theme CTD implementation process. This phase allowed for the transition from descriptive coding to interpretive thematic analysis.

### **Phase 4: Reviewing Themes**

At this stage, I reviewed the grouped content within each node generated during initial coding. NVivo's organization of coded data allowed me to revisit and compare all related excerpts efficiently. This review enabled me to identify meaningful patterns, commonalities, and variations across participants, which supported the refinement and confirmation of emerging themes.

### **Phase 5: Defining and Naming Themes**

Each theme was then defined in terms of its significance to the research questions

and aligned with Vygotsky's theoretical theory. Table 2 shows the progression from codes to categories to themes to theory related themes. For example:

- Training and preparation captured participants' emphasis on comprehensive initial training and ongoing professional development to support CTD implementation. It also aligns with the role of MKO
- Baseline and skills assessment shows the process of identifying a learners ZPD
- CTD Implementation process shows instructional scaffolding and how prompt is used.
- Social interaction and communication shows sociocultural learning with peer interaction and workplace engagement.
- Barriers and challenges show challenges during scaffolding from the MKOs
- Recommendations for improvement show how structured systems, models and training can better support the learner within their ZPD.
- Barriers and challenges reflected difficulties such as limited training, inconsistent implementation, and lack of administrative support.

### **Phase 6: Producing the Report**

The themes were integrated into the findings and aligned with Vygotsky's ZPD framework. Each theme not only describes the participants' experience but also shows how these experiences were reflected in the CTD process, such as scaffolding instruction and the role of the MKO (see Table 2).

**Table 2***Data Analysis Steps*

| Code (Child Node)                         | Category (Parent Node)                 | Theme                                | Theoretical Construct   | Question# |
|---|--|--------------------------------------|---|-----------|
| Pre-implementation Education Learning CTD | Education and Training                 | Training and Preparation             | More Knowledgeable Others; Scaffolding                        | 1         |
| On-the-job Training                       | Education and Training                 | Training and Preparation             | More Knowledgeable Others; Scaffolding                        | 3         |
| Experience with CTD                       | Education and Training                 | Training and Preparation             | More Knowledgeable Others; Scaffolding                        | 10        |
| Using CTD in Job Settings                 | Experience and Implementation Context  | CTD Implementation Process           | Scaffolding; Zone of Proximal Development                     | 2         |
| CTD Teaching Process                      | Experience and Implementation Context  | CTD Implementation Process           | Scaffolding; Zone of Proximal Development                     | 4         |
| Assessing Readiness and Progress          | Experience and Implementation Context  | CTD Implementation Process           | Scaffolding; Zone of Proximal Development                     | 5         |
| Promoting Social Interaction              | Assessment and Instructional Practices | Baseline and Skills Assessment       | Zone of Proximal Development; Scaffolding                     | 6         |
| Facilitating Progress                     | Social Development and Support         | Social Interaction and Communication | Sociocultural Context; Zone of Proximal Development           | 7         |
| Challenges in Implementation              | Outcomes and Impact                    | Outcomes and Impact                  | Zone of Proximal Development                                  | 8         |
| Improvement Recommendations               | Barriers and Recommendations           | Barriers and Challenges              | More Knowledgeable Others; Sociocultural Context              | 9         |
|   | Barriers and Recommendations           | Recommendations for Improvement      | More Knowledgeable Others; Scaffolding; Sociocultural context | 11        |

### **Evidence of Trustworthiness**

Establishing trustworthiness in qualitative research is crucial for maintaining the integrity of both the study and its findings. Trustworthiness is built upon four key elements: (a) dependability, (b) credibility, (c) confirmability (d) transferability (Ravitch & Carl, 2016). Dependability was achieved by conducting an inquiry audit, which involved thorough documentation of the data collection and analysis processes. This audit helped ensure consistency and reliability throughout the study by confirming that the collection, coding, and interpretation of data were conducted systematically (Ravitch & Carl, 2016).

As outlined in Chapter 3, I ensured that interview transcripts accurately reflected the participants' responses and that the data analysis remained consistent with the original data. NVivo 15 contributed to dependability by organizing transcripts, maintaining detailed records of coded data, and allowing for the systematic storage of codes and themes within a structured node hierarchy. The software also enabled consistent application of codes across cases and supported the retrieval of data segments during multiple rounds of analysis. This ensured that coding decisions could be reviewed, and refined over time, reinforcing the study's methodological rigor.

Credibility was supported through debriefing, member checking, and reflexivity practices. Debriefing sessions with my dissertation chair allowed me to critically examine potential biases and refine my interpretations of the data. Member checking provided

participants with the opportunity to review their interview transcripts and ensure that their intended meanings were accurately captured. Participants were given a chance to make additions or clarifications to their transcripts; however, no changes were requested after their review. Reflexivity involved continuously reflecting on my own thoughts, assumptions, and positionality as a researcher. Throughout data analysis, I engaged in memo writing down my thoughts and interpretations, which helped ensure that emerging themes were grounded in the data rather than shaped by personal assumptions.

Confirmability in this study was strengthened through the use of an audit trail and consistent coding practices. I documented each step of the analytic process, including how initial codes were developed, refined, and grouped into broader themes. NVivo played an important role in enhancing confirmability by allowing me to retrieve all coded segments under each node, view content across participants, and cross-check consistency between codes and data excerpts. For example, references to “on-the-job training” were automatically grouped within the corresponding node in NVivo, which enabled efficient review and verification across transcripts. This structured process ensured that the findings were based on the participants’ perspectives, not influenced by researcher bias.

Importantly, while NVivo 15 supported the management and organization of data, it did not perform any automatic interpretation, coding, or theme development. NVivo does not generate meaning from data or decide what is important those responsibilities remain solely with the researcher (QSR International, 2020). All coding decisions, theme naming, and analytic conclusions were made manually through my close reading and

interpretation of participant responses. This approach aligns with Merriam and Grenier's (2019) assertion that qualitative data analysis is an interpretive act rooted in the researcher's critical judgment. NVivo served as a tool to increase transparency and consistency but did not replace the researcher's analytical role.

Transferability was addressed by providing rich, detailed descriptions of participant experiences, contextual factors, and implementation settings. Thick descriptions offer readers the information necessary to assess whether the findings may be applicable to other contexts involving CTD implementation with young adults on the autism spectrum. Together, these strategies supported a transparent, rigorous, and trustworthy analysis that remained faithful to participants' voices and aligned with established qualitative research principles (Merriam & Grenier, 2019; QSR International, 2020; Ravitch & Carl, 2016).

## **Results**

The purpose of this study was to explore the experiences of SPED professionals in implementing the CTD strategy with young adults with autism, aged 18 to 40, in employment settings. The analysis revealed seven overarching themes, each of which is closely aligned with the study's theoretical framework. These themes reflect and illuminate the participants' responses, further reinforcing the relevance and applicability of the guiding theoretical framework.

### **Theme 1: Training and Preparation**

All participants agreed that professional development was essential for CTD

success. According to Participants 1, 3, and 4, training often followed the Behavior skills training model, which includes instruction, modeling, rehearsal, and feedback. For example, Participant 2 highlighted the role of ongoing mentorship, continuing education units (CEUs), and conferences such as ABAI in maintaining staff competency. Participant 5 emphasized one-on-one coaching from a BCBA as foundational to learning CTD techniques. Participant 6 noted the value of annual conference-based continuing education but stressed the importance of modeling and repetition when training coordinators are unfamiliar with behavioral strategies. Participant 7 described annual refresher training, along with accumulated experience, as the main forms of preparation. Both participants emphasized that ongoing, hands-on training and experience are key to maintaining CTD fidelity. These training approaches exemplify the role of the MKO in Vygotsky's (1978) framework by providing expert guidance to move learners and practitioners through their respective zones of proximal development (Daniels, 2001). The training ensures that implementers have the appropriate knowledge and support to enhance fidelity and improve learner outcomes.

## **Theme 2: CTD Implementation Process**

Three participants implemented CTD in both discrete trial and naturalistic teaching formats, by gradually increasing time delays to fade prompts and promote independent responding. Participant 3 explained,

I usually start with like zero second delay with the most-to-least prompting if this is a brand-new skill that the individual doesn't quite

know how to do or doesn't have any experience with. And then I transition to a fixed time delay anywhere from three to five seconds to encourage independent responses. Afterwards, I use differential reinforcement, reinforcing independent responses while providing corrective feedback for errors. Of course, there's always data collection. We collect data with some of our individuals on the prompts that they're using. While others seem to acquire skills more quickly, we just use a correct/incorrect data collection system. But if we are collecting prompts, we're collecting on most-to-least prompting until the skill is emerging. Then, once we're transitioning from emerging to trying to get it mastered, we switch to a least-to-most model. That's where that constant time delay really is important. So, yeah, the idea is to adjust the time delay and prompt levels based on individual performance.

Participant 5 also discussed the use of delayed prompts in vocational settings:

We use the delayed prompts with a lot of clients, and we typically use task analyses and mock vocational tasks. For example, we set up scenarios, let's say, we have a store for our clients to work in, and we have a POS system set up on one of our computers. We have food items like different kinds of snacks chips, Little Debbie snacks, sweets, candy for them to stock in cabinets. So, we use those kinds of tasks.

Participant 6 implemented time delays in a restaurant setting with safety

considerations, typically waiting up to ten seconds before offering prompts. Gestural and model prompts were used depending on the learner's response patterns.

Participant 7 emphasized the use of visual and auditory prompting, including gesture- and picture-based strategies, which were adjusted based on the individual's needs and the environment.

These structured and individualized approaches align with Vygotsky's (1978) concept of scaffolding, in which support is gradually removed as competence increases (Zucker et al., 2020). As learners acquire proficiency, the CTD model supports their progress through the Zone of Proximal Development (ZPD) toward greater independence. CTD was implemented through systematic instruction across a variety of job tasks, with professionals adhering to fixed-time prompt delays and reinforcement strategies.

### **Theme 3: Baseline and Skills Assessment**

Participants consistently emphasized the need to assess learners' current abilities before implementing CTD. These assessments included standardized tools such as the Vineland Adaptive Behavior Scales and custom scenario-based measures. Participant 3 described their assessment approach:

The main go-to assessment tool that I use is an in-house tool that I created myself. But I also have a secondary tool that I use that is developed off of Dr. Lerman's studies on job training. So basically, the assessment process is assessing how individuals respond in different conditions. There might be a condition where you

have broken materials, missing materials, vague instructions, or vague feedback from a supervisor. The idea is that the social skills the individuals are learning are how to ask. Let's say the condition is a vague feedback condition and what we're assessing is the individual's ability to ask for more information that would allow them to get adequate information to complete the tasks. In the initial assessment process, we're getting a baseline on the individual's abilities to engage in such communication skills, and we're also looking at their behavioral readiness.

Similarly, Participant 5 discussed using mock interviews and a response content scale to evaluate social readiness:

We decide whether or not the responses to interview questions are poor, fair, good, or excellent. We also give out a self-assessment containing 31 items that ask about how they feel about their social skills in a job setting. They respond with: A, 'Almost always I'm really good at this'; B, 'Sometimes I'm okay with this'; or C, 'Rarely I'm not very good at this.' One example item is: I maintain good personal hygiene, like taking a shower, brushing teeth, combing hair, and washing hands.

Participant 7 described a collaborative assessment process prior to implementing services:

I participate in assessing learners' readiness and current skills before implementing services. Before I can implement the plan, I have a meeting with other team members about the client's overall functioning. At that meeting, we

discussed the services the client receives like medication, vocational training, and housing. We also ensure that the client is involved in decision-making, including whether to add or remove services. We discuss goals and objectives to help everyone understand how the intervention should be carried out.

Lastly, Participant 6 described conducting interviews and using a custom checklist to evaluate each worker's baseline performance and identify skills requiring support:

So it starts with their interview, honestly, meeting them and seeing what types of experiences they've already had. Most have never had a job, but even the ones who haven't, had some have had some type of exposure through high school, through volunteering, or a work program. Then the assessment continues when they begin with us. Within the first couple of days of work, we're able to see what they already know, and the checklist helps guide us as well. That's how we assess their readiness, and the checklist also helps track their progress. We use a general checklist that doesn't capture all the skills they learn, but it highlights the most critical skills needed to secure a permanent job. That information allows me to determine what they need to learn. Once we begin teaching those individual skills, that's where a time delay would be used. For example, following a one-step direction, like in the restaurant setting maybe something like, "put this dirty dish away in the sink." Before jumping in to deliver a prompt, we wait to see if they can follow it on their own. Given that we're in a restaurant setting, with

equipment all around, for safety reasons I wouldn't want to wait too long no more than 10 seconds.

This approach reflects Vygotsky's (1978) concept of the ZPD, which distinguishes between what learners can do independently and what they can achieve with guided assistance.

#### **Theme 4: Social Interaction and Communication**

CTD was also used to foster social engagement in workplace settings. Participant 2 described encouraging self-directed social interactions and using social groups to reinforce independence. Participant 2 explained,

Another BCBA besides me has been putting measures into place to train the RBTs to set up the activity and then step back essentially using that time delay to avoid heavily guiding the social interactions. The idea is to let the learners self-direct their interactions and only intervene when a problem arises. Essentially, we're waiting until something happens, like when they start to butt heads, and then the RBT is expected to come in and prompt them to use a strategy to resolve the conflict.

Professionals also described integrating CTD into teaching social communication skills such as greetings, conversational reciprocity, and workplace etiquette. These applications align with literature highlighting the importance of social communication in workplace success and job retention for ASD (Burt et al., 1991; Hendricks, 2010; Wehman et al., 2018). The use of CTD in these contexts supports the generalization of learned behaviors

into real-world interactions (Pellicano, 2010; Pouliot et al., 2017).

Participant 4 reported using CTD during natural environment training (NET), incorporating peer-to-peer prompting and shared activities to teach reciprocal communication. Similarly, Participant 3 embedded CTD strategies in workplace scenarios such as gossiping or help-seeking, emphasizing the importance of teaching socially appropriate responses. Participant 3 elaborated,

You can do that in multiple ways. One of the ways that I do it is by having myself, as the BCBA, and an RBT acting as a peer in the workplace. I might assign a paired or group task with the RBT and the learner, such as sorting inventory together or assembling materials, so they can use collaborative problem-solving. The idea is that the learner would ask the peer if they're unsure about a task or ask for information. By embedding social communication into CTD like saying, "Can you show me how?" or "Where does this go?" it helps with workplace greetings, small talk, and responding to supervisors. Another way we encourage social interaction in a job setting is through break room scenarios, where the individual is taking a break and the RBT acts as a surrogate peer. The RBT engages in different types of behaviors in the break room that require social responses from the learner. Sometimes it's simple, like gossip; other times it might involve complaining about workplace conditions. We're expecting specific types of responses that not only help them in those situations but also keep them from saying things that could get them into trouble at work. We also practice

customer interactions, such as taking orders or answering customer questions, and other general workplace discussions what I would call “water cooler talk.” A lot of this is incidental teaching, where I still implement CTD strategies as things come up in the workplace that I haven’t necessarily programmed for. We want to take the time to teach the individual the appropriate responses in those scenarios as well.

Participant 6 discussed the role of CTD in facilitating social opportunities among interns by encouraging reciprocal conversation, planning social events, and teaching conversational turn-taking. Participant 7 similarly reported teaching greetings, conversations, and peer interactions at home that were transferable to job settings, such as greeting supervisors or coworkers appropriately in workplace environments. These efforts align with Vygotsky’s (1978) view that social interaction is fundamental to cognitive development and should be guided by more knowledgeable others (Pomerantez & Pierce, 2019; Vygotsky, 1978). By integrating CTD into peer-based tasks, participants scaffolded learners’ development of essential communication skills within real-life contexts.

### **Theme 5: Barriers and Challenges**

Several barriers emerged that hindered effective CTD implementation. These included inconsistent staff training, behavioral challenges, and prompt dependency, as noted by Participants 1, 2, and 4. P2 specifically cited challenges such as staff forgetting to implement CTD or failing to adjust delays properly, leading to data inconsistency and

poor skill generalization. P6 noted minimal challenges due to careful selection of workers, they acknowledged that staff who were not trained behavior technicians sometimes required additional modeling and repetition to implement CTD effectively.

P7 emphasized the importance of patience during the delay process, warning against over-prompting and identifying delayed processing as a natural part of learning. P4 described how inconsistent fading schedules across technicians could inadvertently reinforce errors. These findings reflect the difficulty of maintaining the right support within the ZPD; if scaffolding is either too strong or too weak, learning may be disrupted (Oncul, 2022). Addressing these barriers requires precise individualized support to match the learner's evolving skill set.

### **Theme 6: Outcomes and Impact**

Participants consistently emphasized the positive outcomes they observed in learners following the implementation of the CTD strategy. These outcomes included increased independence, improved generalization of job-related skills, enhanced social functioning, and greater preparedness for real-world employment environments. These findings align with Vygotsky's (1978) concept of the Zone of Proximal Development, which emphasizes guided learning that gradually fosters autonomy.

CTD was widely supported with supporting learner independence by reducing prompt dependency and encouraging autonomous task completion. For example, Participant 1 stated, "Over time, you start to see them initiate the task without waiting for a prompt, which wasn't happening in the beginning. That's when you know it's working"

Participant 6 echoed this perspective, noting, “At first, we’re there every step of the way, but as they get better, we’re stepping back. It’s clear they’re learning because they’re doing it on their own.”

In a clinical context, Participant 2 described implementing longer wait times before prompting, which led to increased independent responses. They observed, “We started waiting longer before prompting students... we started getting more independent responses.”

Participants reported that CTD facilitated the generalization of skills across different tasks and environments. Participant 5 explained, “They don’t just repeat the tasks, they actually use them even when we change the setup. That’s real learning” Participant 3 shared that CTD supported learners in completing job routines such as clocking in, sorting materials, and asking for help. They noted, “CTD is especially useful for errorless learning, helping individuals gain confidence in completing job-related tasks.”

Several participants highlighted the impact of CTD on learners’ social communication and peer engagement. Participant 7 described how greetings and interactional skills, initially taught in the home, transferred effectively to job settings. They recalled, “We teach them to say hello, listen to instructions, and they carry that behavior into the job. I’ve seen it happen firsthand Participant 6 shared that CTD helped promote social development by embedding delayed prompting into activities such as planning group outings and peer conversations. They reflected, “We learned quickly...

the importance of creating social opportunities,... CTD helped them plan events, ask questions, and solve problems as a group.”

CTD was also seen as enhancing learners’ confidence and readiness for employment. Participant 3 discussed how adjusting time delays and prompt levels based on individual performance contributed to skill mastery and self-assurance. They explained, “We switch to a least-to-most model... that’s where constant time delay really is important. The idea is to adjust the time delay and prompt levels based on individual performance.”

Similarly, Participant 4 observed that CTD promoted independent responding without the need for error correction, reinforcing both competence and motivation. Aside from skill development, CTD was identified as a strategy to reduce helplessness learned. Participants described how CTD supported the development of independence and reduced overreliance on prompts, particularly in job training contexts with young adults.

Participant 6 shared that, in their restaurant-based training program, interns initially required frequent guidance but gradually began completing tasks independently as prompts were delayed. They noted, “When they come to us, most of them have never held a job before... but after repetition and using time delays, we see them manage tasks like putting away dishes or preparing meals without needing reminders.” Similarly, Participant 3 emphasized that CTD helped learners overcome passive responding and begin initiating actions in realistic job simulations: “We provide structured support and then pull back... Once we increase the delay, learners start to respond without prompting

and you can see the shift in their confidence when they realize they're capable." These examples demonstrate how CTD can disrupt patterns of prompt dependence and encourage self-initiated problem-solving, a key factor in fostering sustainable employment outcomes for young adults with autism.

### **Theme 7: Recommendations for Improvement**

Participants 1, 3, 4, and 5 proposed several recommendations to improve CTD implementation, including greater use of natural settings, individualized goals, emotional regulation supports, and reinforcement of small successes. Participant 1 stressed the importance of creating pseudo work environments and preparing clients in advance for real job expectations. They highlighted the limitations of on-site training and emphasized the need to simulate workplace routines and environments in clinical settings to ensure skill generalization and avoid incidents caused by lack of preparation. Participant 3 emphasized embedding CTD in authentic job environments, encouraging self-advocacy, and using virtual simulations to enhance realism.

Participants also proposed several recommendations to improve CTD implementation, including greater use of natural settings, individualized goals, emotional regulation supports, and reinforcement of small successes. Participant 3 emphasized embedding CTD in authentic job environments, encouraging self-advocacy, and using virtual simulations to enhance realism. Participant 5 highlighted the value of providing learners with attainable goals and ensuring they feel supported throughout the process. These strategies align with Vygotsky's (1978) view that effective scaffolding must be

culturally and contextually relevant, enabling learners to internalize skills and transfer them to real-world settings (Darling-Hammond, 2009). The focus on sustainability, generalization, and learner voice reflects the long-term aim of helping students function independently across environments.

### **Summary**

Chapter 4 presents the findings of a qualitative study that explored the experiences of special education teachers implementing CTD strategy with individuals with IASD in employment settings. The study was grounded in Vygotsky's theoretical framework, particularly the ZPD, to better understand how instructional strategies like CTD can support the transfer of skills from instructional settings to real-world employment settings. Data was collected through semi-structured interviews with seven participants, including behavior analysts and SPED professionals, all with at least two years of experience working with IASD. The participants were purposefully selected from diverse employment and educational settings such as autism clinics, employment and residential settings applying CTD. Interviews were audio recorded, transcribed, and verified through member checking to ensure data accuracy. The data were then analyzed using NVivo 15 software to identify patterns and generate themes.

The findings from the study revealed seven core themes. The first major theme identified in the study was training and preparation. Participants consistently emphasized the importance of comprehensive training to ensure effective implementation of CTD. Many professionals received instruction through Behavioral Skills Training, which

included instruction, modeling, rehearsal, and feedback. Additional preparation included participation in continuing education programs, mentorship, and experiential learning in professional environments. These forms of professional development reflected the influence of more knowledgeable others and provided the necessary scaffolding to support both educators and learners.

The second theme focused on the implementation process of CTD. Participants described how they introduced CTD using structured instructional procedures, beginning with immediate prompts and gradually increasing the delay to encourage independent responses. The strategy was used in both discrete trial instruction and more naturalistic work settings. Participants adjusted time delays and prompting strategies according to individual learner needs and context-specific factors. This individualized approach exemplified Vygotsky's concept of scaffolding, whereby support is systematically withdrawn as the learner becomes more proficient.

The third theme involved the role of baseline and skills assessment. Prior to implementing CTD, participants conducted detailed assessments of learners' existing skills, behavioral readiness, and vocational experiences. These assessments included standardized instruments such as the Vineland Adaptive Behavior Scales as well as custom-developed tools designed to evaluate job-related performance and social communication skills. Assessment findings informed instructional planning and helped professionals align interventions with each learner's current capabilities, consistent with Vygotsky's idea of targeting instruction within the learner's Zone of Proximal

Development.

The fourth theme addressed the impact of CTD on social interaction and communication. Participants integrated CTD strategies into peer interactions, group tasks, and simulated workplace situations to promote essential social behaviors such as greetings, conversational reciprocity, and asking for assistance. These activities were intentionally structured to promote generalization and real-world application. Professionals also used natural environment training to support learners in responding appropriately to coworkers and customers. These practices align with Vygotsky's belief in the importance of social interaction as a central mechanism for learning and development.

The fifth theme highlighted the outcomes and impact of CTD. Across all participants, there was consensus that CTD contributed positively to learner development. Reported outcomes included increased independence, reduced reliance on prompts, enhanced generalization of vocational skills, improved social functioning, and greater overall readiness for competitive employment. Learners were observed to initiate tasks independently, demonstrate confidence in job-related activities, and carry over learned behaviors across settings. These outcomes underscore CTD's potential to foster autonomy and meaningful participation in the workplace.

Despite these successes, the sixth theme revealed several barriers and challenges in implementing CTD. Participants noted issues such as inconsistent training among staff, prompt dependency, and difficulties in adjusting prompt delay schedules. In some cases,

staff lacked the necessary behavioral training to implement CTD effectively.

Additionally, learners with slower processing speeds sometimes struggled with delayed prompting. These challenges reflected the complexity of delivering support that is sufficiently responsive to the learner's evolving abilities within the ZPD.

The final theme involved recommendations for improvement. Participants suggested strategies to enhance CTD implementation, including the use of authentic work environments, integration of emotional regulation supports, reinforcement of small successes, and clearer guidance for goal setting. Several participants also emphasized the importance of using virtual simulations and preparing learners for real-world expectations through pre-vocational training. These recommendations highlight the value of contextual and culturally relevant instructional practices, consistent with Vygotsky's emphasis on learning that is situated within meaningful social and environmental contexts. In conclusion, the findings presented in Chapter 4 demonstrate that CTD is a flexible and effective instructional strategy for supporting IASD in developing employment-related and social communication skills. The study highlighted a range of positive outcomes resulting from CTD implementation, including increased learner independence, improved generalization of skills across environments, enhanced workplace communication, and greater readiness for real-world employment. These impacts suggest that CTD not only improves immediate performance but also fosters long-term autonomy and engagement in vocational settings. The study affirms the importance of comprehensive training, individual assessment, and culturally relevant instructional practices. By aligning CTD

strategies with Vygotsky's theoretical constructs such as scaffolding, social interaction, and guidance from more knowledgeable other educators and practitioners can effectively support learners in progressing toward sustainable employment and greater self-determination.

Chapter 5 includes a discussion of the findings and the implication of the study. The limitations of the study and recommendations for further research were also presented in this chapter. The chapter concludes with the potential impact of social change as a result of this research study.

## Chapter 5: Discussion, Conclusions, and Recommendations

This basic qualitative study was conducted to explore the experience of SPED professionals in implementing the CTD instructional strategy for IASD in employment settings. The study aimed to gain insight into how SPED teachers apply CTD in real-world job contexts to improve employment outcomes for IASD. This study followed a basic qualitative research design, which is appropriate for exploring how individuals interpret and make meaning of their experiences (Merriam & Grenier, 2019).

### **Key Findings**

In my study, I identified seven overarching themes that illustrate how CTD is applied in employment settings for individuals with ASD. First, training and preparation emerged as a critical theme with participants emphasizing the importance of behavioral skills training, mentorship and ongoing professional development. Second, the theme of CTD implementation process reflected participants' description of applying CTD strategy across discrete trial, chained vocational and naturalistic contexts where support was systematically reduced to support independence. Third, baseline and skills assessment were consistently emphasized as essential, with participants using both standardized tools and customized measures to align instruction with learner readiness.

Fourth, participants highlighted social interaction and communication as a central domain of CTD application, embedding strategies into greetings, conflict resolution, and customer service tasks to foster workplace engagement. Fifth, despite positive outcomes,

participants described barriers and challenges including inconsistent training, prompt dependency, and variability in fading procedures, pointing to the need for systemic fidelity support. Sixth, the theme of outcomes and impact included increased independence, improved generalization, enhanced social communication, and greater self-confidence. Participants described how learners became increasingly independent as learners moved from requiring frequent prompts and close supervision to completing job-related tasks with minimal or no assistance. This shift was particularly evident as learners transitioned from structured instructional settings to more natural workplace settings. Improved generalization was also reported, as participants noted that learners were able to apply skills initially acquired during discrete trial training to novel tasks and settings, such as transferring cleaning routines learned in a classroom to actual work areas in a coffee shop or office. Enhanced social communication was another major outcome, with learners showing greater confidence in initiating conversations, responding to feedback, and engaging in cooperative work activities. Collectively, these changes contributed to higher levels of personal satisfaction among learners, illustrating the strategy's potential to support not only vocational success but also broader socioemotional growth.

Finally, participants offered recommendations for improvement such as embedding CTD into authentic work environments, reinforcing small successes, integrating emotional regulation supports, and leveraging virtual simulations to strengthen generalization and sustainability. Collectively, these findings affirm CTD strategy as a versatile, evidence-based instructional approach that aligns with Vygotsky's

sociocultural framework. By promoting scaffolding within the ZPD, CTD provides structured opportunities for learners to progress from dependence on prompts toward increasing independence. Participants' experiences reflected that the strategy supported a shift in learners' self-perception from viewing themselves as individuals reliant on continuous assistance to recognizing their capacity as competent and capable employees. Overall, these themes suggest that CTD can foster measurable growth in autonomy, employability, and long-term socioemotional development, underscoring its potential to enhance both vocational and personal outcomes for IASD.

### **Interpretation of the Findings**

#### **Comparison with Previous Literature**

The results of this study reaffirmed the significance of CTD as an instructional strategy for promoting independence, improving communication, and increasing job readiness among young IASD. The findings of this study not only reflected participants' experience with CTD strategy as a means of enhancing communication, job readiness, and independence (Browder et al., 2009; Horn et al., 2020; Riesen et al., 2003; Walker, 2008; Zisimopoulos et al., 2011) but also highlighted its adaptability within authentic employment settings.

Participants in my study consistently reported positive learner outcomes including improved social engagement, greater task fluency, and reduced reliance on prompts, which supports findings from Spooner et al. (2017) and Swain et al. (2015). The structured approach of CTD, involving fixed delay intervals and immediate

reinforcement, has been shown to help students understand expectations and routines (Neitzel, 2009; Swain et al., 2015). The analysis yielded seven overarching themes, each of which contributes to a nuanced understanding of the opportunities and challenges associated with CTD.

### ***Training and Preparation***

Professional development emerged as a central prerequisite for effective CTD implementation. Participants in my study reported engaging in behavior skills training, individual coaching sessions with BCBAs, and attending annual refresher conferences. These accounts reflect the importance of ongoing mentorship and performance feedback, which Lyon et al. (2023) and Rakap (2019) have argued are indispensable for maintaining fidelity in EBPs. Without reinforcement, staff may misuse prompts or fail to fade supports appropriately, leading to prompt dependency and diminished outcomes (Oncul, 2022; Wolery & Hemmeter, 2011). The CEC (2015) has emphasized the need for structured, role-specific professional development, and the present study affirms that CTD is no exception.

### ***CTD Implementation***

Participants in my study described implementing CTD across a variety of instructional formats, which highlights its adaptability to different teaching contexts. For example, some educators applied CTD within discrete trial instruction, focusing on structured learning opportunities designed to teach simple skills step by step. Others used CTD in chained vocational routines, where students learned multi-step tasks such as job-

related skills that required sequential completion. Additionally, CTD was applied in naturalistic teaching environments, where instruction was embedded into everyday activities and interactions, allowing skills to be taught in more functional and spontaneous ways.

These varied applications demonstrate the flexibility of CTD to support both simple and complex learning goals. This finding resonates with Neitzel's (2009) distinction between discrete and chained instruction, where CTD can effectively target either type of skill set. It also aligns with empirical evidence reported by Dogoe et al. (2011) and Browder et al. (2017), who documented CTD's effectiveness across multiple contexts and task types. Collectively, these accounts underscore CTD's value as a versatile instructional strategy capable of being tailored to the demands of diverse learning environments.

Importantly, the participants in my study indicated that the strategies were not confined to classroom practice. Educators embedded CTD into authentic job responsibilities such as stocking shelves, clocking in, handling point-of-sale transactions, and managing safety-sensitive restaurant tasks. Participants applied CTD beyond educational settings (Brock & Carter, 2013; Spooner et al., 2017) into employment contexts that remain underrepresented in the literature (Horn et al., 2020; Oncul, 2022).

### ***Baseline and Skills Assessment***

Initial assessment was repeatedly emphasized as a critical foundation for tailoring CTD instruction. Participants relied on standardized instruments such as the Vineland

Adaptive Behavior Scales, customized checklists, and mock interviews to establish learners' readiness levels. This individualized approach aligns with Bennett and Dukes (2013), who argued that baseline measures are necessary to determine prompt levels, reinforcement schedules, and instructional pacing.

The practice also reflects the CEC's (2015) guidelines for learner-specific programming. By situating CTD strategies within each learner's ZPD, educators ensured that support was appropriately calibrated to foster growth (Vygotsky, 1978). Notably, this study addresses a gap identified by Nougaret et al. (2005), who pointed out that much of the CTD literature describes procedures without exploring how assessment data informs adaptations to real-world instructional contexts.

### ***Social Interaction and Communication***

A significant theme that emerged concerned CTD's potential to enhance workplace communication skills. Participants reported that CTD was implemented to promote social competence and independence in real job settings. Instructors systematically applied delayed prompting procedures to foster autonomous responding during social exchanges such as greetings, small talk, conflict resolution, and customer service interactions. Initially, instructors modeled or prompted appropriate behaviors and then gradually increased the delay interval, allowing learners to initiate and sustain interactions without direct support. This structured fading process encouraged learners to self-direct communication, manage disagreements, and engage appropriately with peers, supervisors, and customers. The application of CTD in these contexts supported the

generalization of social behaviors across settings and reflected real-world communication demands, reinforcing learners' autonomy and adaptive functioning in workplace environments. These outcomes align with prior research indicating that communication deficits are a major predictor of unemployment among individuals with ASD (Burt et al., 1991; Hendricks, 2010; Hurlbutt & Chalmers, 2002). By embedding CTD within natural exchanges such as breakroom conversations, peer collaborations, and customer interactions, participants effectively addressed the persistent challenge of skill generalization identified by Pellicano (2010) and Riches and Green (2003).

Several participants also described incorporating visual support and scripted prompts to scaffold conversational reciprocity during instruction. These included picture cues, dialogue templates, and structured role-play activities designed to help learners initiate and maintain workplace conversations. Four of the seven participants reported using this support regularly when introducing new social or communication skills. They perceived such strategies as valuable for enhancing social engagement and reducing difficulties associated with pragmatic language use and weak central coherence, which are commonly observed among IASD learners (Divya et al., 2023; Jolliffe & Baron-Cohen, 1999; Kim et al., 2023).

### ***Barrier and Challenges***

Despite its promise, participants noted several challenges such as inconsistent staff training, variability in prompt fading, and over-reliance on error correction. These barriers reflect concerns raised by Hughes et al. (2002), Oncul (2022) and Wolery and

Hemmeter (2011), who found that fidelity of implementation of CTD procedures often suffers without clear protocols.

Over-prompting or failure to extend delays interrupts the scaffolding process central to CTD and risks reinforcing errors instead of promoting autonomy. While Vygotsky's (1978) sociocultural theory emphasizes the gradual withdrawal of support as learners internalize new skills, applied behavior analytic research provides the procedural framework for operationalizing this principle through systematic fading (Cooper et al., 2020; Wolery & Gast, 1984). To counter these challenges, participants stressed the need for systemic support, including ongoing mentorship, fidelity monitoring, and organizational commitment to professional development. These findings support CEC (2015) standards and Rakap's (2019) request for sustained in-service training.

### ***Outcomes and Impact***

Participants observed a range of positive learner outcomes, including greater independence, improved generalization of skills, enhanced social communication, and increased self-confidence. These findings are consistent with Browder et al. (2017), Carter et al. (2012) and Taylor and Seltzer (2011), who documented similar learner benefits of structured instructional practices.

Notably, CTD was found to reduce prompt dependency, a barrier that has been widely reported (Oncul, 2022). By systematically extending delay intervals and reinforcing independent responses, learners began to initiate tasks autonomously, demonstrating principles of errorless learning (Swain et al., 2015). Participants also noted

improvements in executive functioning, including planning, problem-solving, and working memory, which resonated with findings by Diamond (2013) and St. John et al. (2022).

Further, participants in my study indicated that CTD indirectly supported behavioral regulation by embedding learners in predictable routines that minimized frustration and encouraged adaptive behaviors, reflecting the work of Schall and McDonough (2010). These outcomes underscore CTD's potential not only as a teaching method but also as a tool for improving employability and long-term vocational success.

### ***Recommendations for Improvement***

Finally, participants offered several recommendations to enhance CTD implementation for SPED teachers. These included improved generalization. Cheak-Zamora et al. (2015) argued that transition planning should emphasize real-world practice, which aligned with participants call to embed CTD instruction into real job settings and communication context. Rammler and Ouimette (2016), in contrast, highlighted the role of professional development for educators, echoing participants emphasis on ongoing training and support. Additional recommendations included integrating virtual simulations, setting individualized goals, and reinforcing incremental successes. Such approaches reflect (Darling-Hammond, 2009), who emphasized the importance of contextually relevant scaffolding to sustain learning and promote independence. Participants also recommended support for emotional regulation, consistent with Schall and McDonough (2010), who warned that behavioral challenges

can compromise job retention if unaddressed. Together, these recommendations suggest a more holistic model of CTD that integrates cognitive skill-building, socio-emotional development, and environmental adaptations.

### **Theoretical Implications**

The findings of this study extend Vygotsky's sociocultural theory by demonstrating how the implementation of CTD in employment contexts for individuals with ASD can be understood through the constructs of MKO, scaffolding, the ZPD, and sociocultural context. Each construct illuminates different aspects of participants' experiences and highlights how theory explains the mechanisms behind successful CTD implementation (Vygotsky, 1978).

### **More Knowledgeable Others**

Training and preparation were central to participants' accounts of successful CTD implementation. Supervisors, coaches, and behavior analysts functioned as MKOs by providing systematic instruction, feedback, and ongoing mentorship. Participants described professional development opportunities such as one-on-one coaching, continuing education, and modeling as essential support that allowed them to develop competence and fidelity in CTD. These findings illustrate the role of MKOs in transferring expertise and ensure that practitioners can carry out evidence-based practices effectively with adequate support. Without this guided expertise, participants noted difficulties in maintaining fidelity and addressing learner needs, underscoring the theoretical importance of MKOs in shaping skill acquisition (Daniels, 2001).

**Scaffolding**

The process of implementing CTD reflected how scaffolding is being used . Participants consistently described starting with full support, such as immediate prompting or structured modeling, and then gradually withdrawing assistance as learners developed independence. Adjustments to the timing of prompts, reinforcement strategies, and error correction represented practical forms of scaffolding. These strategies ensured that support was matched to learner progress, preventing over prompting while still fostering success. The study demonstrates how CTD operationalizes scaffolding by sequencing instruction so that learners are not overwhelmed but are progressively challenged, which is consistent with Vygotsky's view of guided learning (Vygotsky, 1978).

**Zone of Proximal Development**

Participants' emphasis on baseline and skills assessment highlights the importance of identifying the ZPD. Before implementing CTD, professionals used checklists, interviews, and standardized assessments to establish learners' current abilities and readiness. Instruction was then tailored to target what learners could accomplish with assistance but not yet independently. As participants described, the effectiveness of CTD depended on calibrating the delay intervals and level of prompting to each individual's performance. Outcomes such as increased independence, reduced reliance on prompts, and enhanced workplace confidence demonstrate learners' progression through their ZPD when instructional supports were appropriately aligned (Vygotsky, 1978).

### **Sociocultural Context**

The findings also underscore the sociocultural dimensions of CTD. Participants described using CTD to support workplace communication, peer collaboration, and customer interactions. These social practices are embedded in real world cultural contexts, highlighting that learning is not only cognitive but also social and relational. Barriers such as inconsistent staff training, organizational constraints, and difficulties generalizing skills across settings reflect the influence of broader social systems on implementation. Recommendations to embed CTD in authentic job settings, reinforce small successes, and address emotional regulation needs emphasize the importance of culturally relevant scaffolding. These insights reinforce Vygotsky's assertion that learning occurs within meaningful social interactions and cultural settings (Vygotsky, 1978).

Taken together, the findings suggest that CTD functions as a practical application of Vygotsky's theoretical constructs in employment training for individuals with ASD. MKOs support practitioner competence; scaffolding ensures instruction is systematically faded; the ZPD guides assessment and instructional targeting; and sociocultural context situates learning within authentic job settings. By framing CTD implementation within these constructs, this study demonstrates not only how the strategy promotes independence, communication, and employability but also how sociocultural theory provides a coherent explanation for its effectiveness in real world contexts.

### **Recommendations for Future Research**

Future research should first address fidelity and CTD implementation challenges. Mixed methods designs that combine observational data with participant interviews would provide a clearer picture of how CTD is delivered in authentic contexts, as suggested by Rakap (2019) and Lyon et al. (2023). This approach would clarify barriers such as inconsistent prompt fading or over reliance on error correction (Oncul, 2022; Wolery & Hemmeter, 2011) and generate actionable insights for training and supervision. Investigating CTD's influence on long term employment outcomes, such as job retention, satisfaction, and autonomy, would further extend its practical relevance beyond initial skill acquisition (Wehman et al., 2018).

Given participants' reports of limited access to authentic job placements, researchers should also explore innovative instructional alternatives. Virtual and augmented reality simulations may provide scalable options for teaching workplace routines (Pugliese et al., 2015), especially in settings where live practice is not feasible. At the same time, incorporating the voices of autistic individuals in the design and evaluation of CTD interventions would strengthen social validity (Koenig et al., 2012) and ensure that practices align with learner preferences and personal experiences.

Finally, there is value in pursuing cross disciplinary integration. Combining applied behavior analysis precision and structure with insights from educational psychology, such as metacognitive strategy instruction, social emotional development, and motivation theory (Woolfolk, 2019), may support broader skill generalization and

autonomy. Subfields like vocational rehabilitation counseling and cognitive psychology offer additional frameworks for enhancing executive function, problem solving, and adaptive behavior (Diamond, 2013; St. John et al., 2022), all of which are critical for sustained employment (Schall & McDonough, 2010). While ambitious, such blended models hold promises for advancing CTD from a narrowly defined instructional method toward a holistic approach that fosters independence, employability, and long-term social inclusion.

### **Social Change Implications**

The findings of this study demonstrate the potential for significant social change by showing how the use of the CTD strategy can support workplace inclusion and independence for young IASD. This research revealed that when professionals are properly trained and supported, they are able to apply the strategy in a way that equips IASD with essential job skills and prepares them for successful employment. The application of this strategy in real work environments moves beyond theoretical or classroom instruction and instead provides individuals with authentic opportunities to practice and refine their skills. In this way, the study points to the importance of strengthening training systems for professionals so that implementation is consistent, reliable, and effective.

A key implication for social change is that the preparation of professionals has a direct impact on the outcomes of the individuals they support. When training is comprehensive and delivered with consistency, professionals are better able to scaffold

learning, gradually reducing prompts and increasing independence. This creates opportunities for young IASD to engage in meaningful employment, which in turn enhances their confidence, self-worth, and contributions to society. Expanding access to structured professional training has the potential to benefit not only the individuals with autism who are directly supported but also employers and communities who gain from a more inclusive workforce.

The results also highlight that CTD strategy encourages social interaction and communication in the workplace. By practicing job-related tasks alongside peers and coworkers, young adults with autism are able to develop interpersonal skills that are essential for long-term employment success. The implications for social change extend beyond the immediate context of skill acquisition, as the development of communication and social abilities strengthens the individual's capacity to build relationships and navigate social expectations. These changes contribute to greater inclusion in the workplace and a reduction in the isolation that individuals with autism spectrum disorder often experience.

Another important implication of this study concerns the barriers that professionals identified. Limited training, inconsistent implementation, and lack of administrative support were noted as challenges. These findings suggest that without adequate organizational structures, the potential benefits of CTD strategy may not be fully realized. From a social change perspective, this underscores the importance of creating systems that promote sustainability and fidelity in implementation. Developing

policies that provide ongoing professional development, monitoring, and support will ensure that interventions are consistently delivered across various employment settings. When such systems are in place, organizations can better prepare individuals for independence, reduce the risk of prompt dependency, and increase the likelihood of long-term employment stability.

The study also emphasizes the importance of assessing readiness and progress in order to provide instruction that aligns with each individual's needs. By tailoring support to the skills and abilities of the learner, professionals are able to create opportunities for growth that are realistic and meaningful. This process of individualized instruction contributes to a more equitable system in which young IASD can achieve success at their own pace. The broader social implication of this finding is that inclusion is not about uniformity but about meeting individuals where they are and ensuring they have the tools to advance toward independence. Such an approach fosters a more just and inclusive society where neurodiverse individuals are valued for their unique contributions.

The recommendations for improvement provided by participants further strengthen the argument for systemic change. Participants noted the need for structured systems, supportive models, and consistent professional guidance. Implementing these recommendations has the potential to transform not only the experiences of professionals but also the opportunities available to individuals with autism. A system that invests in training, models best practices, and provides ongoing support creates a ripple effect that extends far beyond the workplace. Communities benefit from reduced unemployment,

families experience increased stability, and individuals gain access to lives characterized by dignity, independence, and meaningful contribution.

Finally, the overall implication of this study is that CTD strategy can serve as a pathway for greater social equity. By demonstrating that individuals with ASD can succeed in employment when provided with appropriate instruction and support, this study challenges stereotypes and reduces stigma. It reinforces the idea that disability does not define capability and that with the right systems in place, barriers to inclusion can be dismantled. The resulting social change is one in which workplaces become more diverse, communities become more inclusive, and society as a whole benefits from the participation of all its members.

In conclusion, this study shows that the implementation of CTD strategy has the power to promote independence, enhance social communication, and support long-term employment success for young IASD. The implications extend beyond the individuals directly involved and point to the broader societal benefits of structured training, inclusive practices, and equitable opportunities. By addressing the barriers identified by the participants in my study and adopting their recommendations, organizations and communities can create environments that foster dignity, inclusion, and meaningful participation for neurodiverse individuals. Such change is not only possible but necessary for building a society that values and supports the contributions of every individual.

### **Conclusion**

This study explored the experiences of professionals implementing the CTD

strategy with young adults with autism in employment settings. Through a rigorous qualitative methodology grounded in ZPD, this research revealed seven major themes that offer a nuanced understanding of how CTD supports employment readiness and social integration for individuals with IASD. The findings of this study indicate that when CTD is implemented with individualized planning, appropriate support and fidelity, it can significantly lead to meaningful improvements in employment outcomes for the IASD. Specifically, it helps develop both functional skills necessary for job performance and social skills essential for employment stability.

The experiences shared by participants confirmed that CTD is a powerful instructional strategy for fostering independence, enhancing communication, and preparing learners for real-world employment demands. The importance of comprehensive baseline and skills assessments was consistently emphasized as a foundation for aligning instruction with learners' current abilities and needs. These assessments, often incorporating both standardized tools and job-specific checklists, served as a critical step in designing interventions within each learner's ZPD by ensuring that instruction was neither too challenging nor too simplistic.

The implementation of CTD strategy was described across a variety of instructional formats, including discrete trial teaching and naturalistic environments. Participants detailed how structured prompting hierarchies, combined with systematic fading and reinforcement, enabled learners to progress from prompted responses to independent functioning. These strategies were reinforced by behavior skills training,

which emerged as a key professional development approach that ensured procedural fidelity and competence among staff. The integration of CTD into social communication instruction varied from greetings and small talk to workplace problem-solving and peer interactions and highlights the multifaceted utility of the approach. Participants reported using CTD not only for skill acquisition but also to support social interaction and appropriate workplace behavior, a critical component of employment retention for the IASD.

However, this study also illuminated several barriers that must be addressed for CTD to achieve its full potential. These included inconsistencies in staff training, prompt dependency, limited access to natural job settings, and variations in implementation fidelity. These challenges indicate the importance of robust organizational systems that support continuous training, performance feedback, and quality assurance measures. Without such structures, the risk of misapplication or diminished impact of CTD is high.

The participants' recommendations for improvement emphasized authentic learning contexts, learner voice, culturally responsive practices, and emotional regulation supports. These insights align closely with best practices in inclusive education and vocational training, and they reinforce the necessity of embedding interventions within real or simulated work environments that reflect actual job demands. Additionally, this study highlights the need for professional development programs that extend beyond initial training to include mentorship, modeling, and ongoing coaching which are key factors in building staff capacity and sustaining high-quality instruction over time.

From a theoretical standpoint, this research reinforces the relevance of Vygotsky's sociocultural theory, particularly the concepts of scaffolding and the role of MKOs. Participants functioned as MKOs who guided learners through their ZPD, facilitating gradual independence and mastery. The alignment between theory and practice in this study strengthens the argument for structured, socially valid interventions grounded in developmental and cognitive principles.

This dissertation also indicates the need for continued research and innovation in the field of autism and employment. Future research should incorporate observational and longitudinal methodologies, include the perspectives of the IASD and employers, to investigate the application of emerging technologies, such as virtual reality, to simulate authentic job settings. Interdisciplinary approaches that integrate behavior analysis with educational psychology, cognitive science, and vocational rehabilitation hold promise for enhancing the effectiveness and social validity of intervention models. Such integrated frameworks may also address broader constructs such as executive functioning, motivation, and adaptive behavior that are critical for sustained employment and increased autonomy among individuals with ASD.

The implications of this study extend beyond the experience of SPED professionals implementing CTD, however at the systems level, the research advocates for organization-wide strategies that ensure equitable access to employment preparation for neurodiverse individuals. Establishing inter agency training frameworks, performance-based coaching models, and formal policies for CTD implementation can

institutionalize high standards of practice and accountability. These structures not only improve instructional consistency but also advance the broader goal of workplace inclusion and equity.

In conclusion, the findings of this study affirm the value of CTD as a culturally responsive, evidence-based strategy that can transform employment preparation for individuals with ASD. By addressing both functional job skills and critical social competencies, CTD offers a comprehensive framework for supporting neurodiverse individuals in achieving meaningful, stable employment.

This research extends understanding by moving beyond classroom applications and demonstrating the strategy's utility in authentic employment environments, thereby contributing new knowledge to the fields of special education, applied behavior analysis, and vocational training. It calls upon educators, policymakers, and researchers to invest in systems that promote equitable opportunities and long-term success for the autism community.

As a researcher, I recognize that the strength of this study lies in the expertise of its participants, whose voices shaped the interpretation of the findings. Ultimately, the adoption of CTD is not only a means of improving employment outcomes but also an ethical responsibility to create inclusive communities where the dignity, independence, and contributions of all individuals are fully recognized.

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have taught Young IASD students in a job setting (c) have met the education and experience criteria to work with young individuals with Autism. Your participation is confidential and voluntary. You have the right to withdraw at any time if you decide not to proceed with the interview. The duration of the interview will be approximately 60 minutes, and with your consent, it will be audio recorded. Please note that recording this session will allow me to effectively transcribe the exact words spoken and assure greater accuracy of capturing your responses. Do you have any questions? If you consent to the audio recording, please say “I consent.”

### **Interview Questions**

The interview questions will consist of questions designed to address the research questions which will answer questions related to the development and delivery of constant time delay strategy to better support high functioning IASD with moderate cognitive challenges in a job setting.

1. What education and training did you receive before you began implementing CTD?
2. What is your experience working with students with ASD that are receiving constant time delay in a job setting?
3. Describe the process by which you learned to use CTD?
4. How did you come to use CTD in the job setting with IASD?
5. Can you describe your CTD classroom process?
6. In your current teaching setting, how do you assess students’ readiness and

progress in the job setting?

7. Can you tell me how you create opportunities for social interaction in the process of using CTD in the job setting?
  8. Do you feel that CTD facilitates the students' progress to functioning in a job setting? How?
  9. Can you explain what barriers/challenges you perceive when implementing CTD?
  10. What training, collaboration, resources, coaching, conferences, and mentoring have been provided to you on the job?
  11. What would you recommend in improving the implementation of CTD for young IASD in a job training program?
- Is there anything else that you would like to add regarding implementing CTD to the young IASD in job training?

## Appendix B: Recruitment Flyer

### **You are Invited!**

Are you a Special Education Professional with the job title Direct Support Professional, Behavior Technician, Behavior Analyst, Behavior Analyst Assistant, Registered Behavior technician, special education teacher or a Job Coach with experience implementing Constant Time Delay (CTD) strategies for young individuals with Autism in a job setting? I am inviting you to participate in an exciting research study aimed at making a meaningful difference!



### **About the Study**

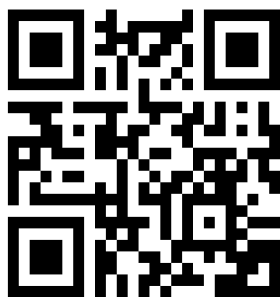
Focuses on exploring Constant Time Delay (CTD) in real-world job settings.  
Aims to enhance job-related skills and independence for young individuals with autism.

### **Participants Benefits**

Share your valuable experiences with CTD interventions in a job setting.  
Provide insights and feedback to improve practices for individuals with autism.  
Contribute to innovative research in behavior analysis and autism support.

### **How to Participate**

Send an email to [REDACTED] stating you agree to participate or scan the QR code below.



### Appendix C: Participants Selection

Dear Mr./Ms. \_\_\_\_\_, this email is to inform you that you have been selected to participate in my study because you meet the participant eligibility for my study. The purpose of my research is to explore the experience of Professionals, implementing a constant time delay (CTD) strategy, for young adults between the ages of 18 and 40 years old with autism in a job setting. If you agree to be part of the study, you will participate in a one-hour interview. This study does not offer direct benefits to participants. However, it aims to benefit the society by informing the development and delivery of special education employment training services to better support high functioning individuals with autism spectrum disorder with moderate cognitive challenges. It could also prepare professionals, administrators, policy makers and researchers to identify areas for improvement during CTD implementation. Your privacy is important, and your identity will be protected. Personal information will not be used for any purposes outside this study. Your name or identifying details will not be included in the research report. Any shared datasets will be anonymized. Data will be securely stored and kept for at least five years as required by Walden University.

Attached you will find the consent form for the study for your signature. Please review,

sign and return the consent form. A copy of the signed form will be provided to you for your records. Thank you for your participation in this study.

Best Regards,

Ayodele Salihu (Walden PhD student)