A PHENOMENOLOGICAL STUDY OF THE PERCEPTIONS OF BEHAVIORAL SUPPORTS FOR STUDENTS WITH LOW FUNCTIONING AUTISM IN VIRTUAL LEARNING PROGRAMS

by

Alicia Loraine Chamberlin

Liberty University

A Dissertation Presented in Partial Fulfillment

Of the Requirements for the Degree

Doctor of Philosophy

Liberty University

2024

A PHENOMENOLOGICAL STUDY OF THE PERCEPTIONS OF BEHAVIORAL SUPPORTS FOR STUDENTS WITH LOW FUNCTIONING AUTISM IN VIRTUAL LEARNING PROGRAMS

by Alicia Loraine Chamberlin

A Dissertation Presented in Partial Fulfillment

Of the Requirements for the Degree

Doctor of Philosophy

Liberty University, Lynchburg, VA

2024

APPROVED BY:

Sherrita Rogers, Ed.D, Committee Chair

Alex Boggs, Ph.D, Committee Member

Abstract

The purpose of this transcendental phenomenological study was to describe the perceptions of Special Education Teachers regarding positive behavioral supports for students with Low Functioning Autism (LFA) and behavioral challenges who participate in virtual learning environments. The theory guiding this study is Thorndike's associative learning theory as it provides a framework for understanding the challenges associated with the application of behavioral supports within the virtual learning environment. The Central Research Question in this study is: What are the shared experiences of Special Education Teachers who implement positive behavioral supports (PBS) for students with LFA and behavioral challenges who participate in an academic virtual learning environment (VLE)? Through observations, interviews, and focus groups, Moustakas' transcendental-phenomenological design was applied to explore the Central Research Question. Ten Special Education Teachers, consisting of nine females and one male, who taught students from grades six-12 online, had at least three years of experience teaching Special Education, and had at least one student in their online class with LFA, participated in this study. There was no physical location for this study. Qualitative analysis revealed what Special Education Teachers considered to be the essential elements of the Laws of Learning. Additionally, the results revealed that training for teachers and parents on how to support students with LFA in the VLE could benefit educational programs, and implementing the essential elements of learning can mitigate challenges related to behavior and learning by addressing the most pervasive areas of deficit (i.e., hypersensitivity and hyposensitivity to sensory stimuli and habituation).

Keywords: low-functioning autism, virtual learning, behavior, laws of learning

Dedication

I dedicate this dissertation to God, my creator. To Him be all the glory!

Acknowledgments

To my husband Adam, who is my love and my partner in life and ministry. Thank you for your support and “sticktoitiveness” in helping me to reach my goals. Your leadership speaks volumes.

To my kiddos Ezekiel and Nevaeh, thank you for being such amazing children and sharing my time and attention with this work. You will do greater things than this.

To my supervisor, who was the guiding light and motivator every step of the way as I researched for this dissertation.

To the women of JASA, you were a sure answer from God in the moments when I needed help the most. Thank you for your encouragement, support, and sisterhood.

Table of Contents

List of Tables

List of Abbreviations

Applied Behavior Analysis (ABA)

Attention-Deficit/Hyperactivity Disorder (ADHD)

Autism and Developmental Disabilities Monitoring Network (ADDM)

Autism Spectrum Disorder (ASD)

Board Certified Behavior Analyst (BCBA)

Centers for Disease Control (CDC)

Computer-Based Intervention (CBI)

Regression (R)

Diagnostic and Statistical Manual of Mental Disorders V (DSM-V)

Evidence-based Practice (EBP)

Extensive Support Need (ESN)

Gamma-Aminobutyric Acid (GABA)

High Functioning Autism (HFA)

Immersive and Non-Immersive Virtual Reality (IVR and NIVR)

Intellectual Disability (ID)

Low Functioning Autism (LFA)

Minimally Verbal (MV)

Positive Behavioral Supports (PBS)

Restrictive and Repetitive Behaviors (RRB)

Virtual Learning Environments (VLE)

CHAPTER ONE: INTRODUCTION

Overview

In the realm of education for students with disabilities, virtual learning is an area with a distinct need for improvement. There is a plethora of research-based interventions that have been vetted to help this population of students to progress in multiple functional and academic areas. These interventions include implementing strategies such as visual supports, social supports, priming, and others (Nuske et al., 2019). Educators and other professionals have been able to adapt many of these interventions to a virtual format to meet the needs of learners who have opted for the virtual education platform. Still, those individuals with the most severe disabilities and behavioral challenges may face barriers that inhibit them from benefitting equitably from virtual learning environments (Tunney & Hanreddy, 2021). They are also largely excluded from the bulk of research supporting these interventions. The need for evidence-based interventions and resources that can effectively meet the needs of the most severely disabled virtual learners is excellent. This chapter will provide an explanation of the historical, social, and theoretical contexts for the problem, a description of the problem and purpose of the study, describe the significance of the study, state the research questions, and define the key terms.

Background

When speaking of disabilities that can severely impact the social and functional lives of those who have received a diagnosis, autism spectrum disorder is one of the most thoroughly researched of these cognitive disorders. Autism Spectrum Disorder (ASD) is a disability for which individuals may have a range of functional, cognitive, communicative, and physical abilities depending on the severity of the disability. According to the Centers for Disease Control (CDC), ASD diagnoses have been on the rise, with it now affecting at least 1 in 54 children

worldwide (Maenner et al., 2020). The effects of ASD have presented challenges for people of all ages and from all backgrounds. There is no evidence that the rate of ASD will soon decrease. Thus, it is vital that the historical, social, and theoretical implications of this disorder be studied so that these individuals and their families can live out their days with all the joy they are entitled to as functioning and contributing members of society.

Historical Context

ASD is a disorder that has been primarily characterized by communication and social deficits. Since its first use in the early 20th century, the term ASD has evolved from Eugen Blueler's original definition as "a withdrawal from external reality in patients with schizophrenia" (Crespi et al., 2010, p. 1736). ASD was later expanded to include individuals who demonstrated "a lack of communicative use of language, preservation of sameness, restricted interest in activities, and stereotypical and repetitive patterns of behavior, such as hand flapping and spinning" (Harris, 2018, p. 3). This description of ASD is the description that most closely resembles what is currently used in the Diagnostic and Statistical Manual of Mental Disorders Text Revision (5th ed.; DSM-5 TR; American Psychiatric Association, 2022).

As a spectrum disorder, there is a wide range of symptom severity that can affect the level of functioning of individuals who are diagnosed with ASD. Because of this, many therapies have been developed to address the needs of individuals with mild, moderate, or severe autistic symptoms. From behavioral modification to a variety of medications, therapies have been developed over time to help individuals with ASD adapt to the ever-changing demands of culture and society. Since the COVID-19 pandemic began in 2020, many providers have had to transition from administering therapeutic services in-person to implementing new or less frequently used telehealth administration models (Pollard et al., 2021). This shift in therapy

administration formats has also affected the field of education (Shire et al., 2020; Stenhoff et al., 2020). With 55% of students receiving remote instruction in 2021 due to the Covid-19 mandated government shutdown, virtual learning surfaced as one of the primary vehicles for providing services to students (Willis & Fensterwald, 2021). However, it has been incredibly challenging to effectively and equitably provide services for individuals with the most severe forms of ASD.

Due to their higher level of need, different supports are required to provide effective and meaningful education to students with Low Functioning Autism (LFA) (typically marked by ASD and Intellectual Disability [ID]) than are needed for students with high-functioning autism (HFA). In many cases, the difference is that more support is needed for students with LFA. According to Tunney and Hanreddy (2021), barriers exist for students with extensive support needs (ESN) who participate in virtual learning environments that, when left unaddressed, can create a situation in which this already marginalized group of individuals is further isolated from their non-disabled peers. Some of these barriers include inequitable access to technology and other teaching aids, lack of assistive technology to support access to instruction, and overall inadequate support to access instruction (Pollard et al., 2021; Tunney & Hanreddy, 2021). Social-emotional and self-regulatory supports such as alone time, structured de-escalation strategies, and other behavioral supports can be challenging to provide without trained support staff or safe spaces (Nuske et al., 2019).

Social Context

Since the COVID-19 pandemic began in 2020, the world has experienced a significant shift in how individuals interact. This global event has also substantially impacted how students with disabilities learn and navigate the world around them (Zhang et al., 2020). The issue of inclusion for students with disabilities existed before this change, and it continued to be a hotly

debated topic afterward. In a study by Gilson et al. (2020), faculty and students defined inclusion as “being valued for what one brings to the interaction, access to opportunities, and being actively engaged alongside others” (p. 78). In summary, inclusion in mainstream society continues to be one of the most significant goals of major disability rights groups, advocates, and individuals.

Because of the sudden restriction in physical interaction with others, many individuals with disabilities were forced into isolation. In many cases, this adversely affected student learning due to a lack of resources such as educational manipulatives and educational personnel to assist with health, access, behavioral needs, and access to technology. Kimble-Hill et al. (2020) explain that students with disabilities face immediate barriers “when layers of accommodation are removed or more difficult to obtain in a timely fashion” (p. 3393). These barriers and lack of equitable technology-based support undermine the goal of inclusion for individuals with disabilities in today’s technology-driven society. It has a particularly detrimental effect on individuals with severe cognitive and behavioral challenges, such as individuals with ASD, hindering their ability to develop the skills needed to function at their highest level of independence in mainstream society. These barriers and lack of resources result in negative implications not only for individuals with disabilities but also for their families and caretakers.

Students with disabilities who participate in distance learning face challenges such as inadequate teacher or caregiver training, lack of digital literacy skills, limited reinforcement, and lack of accommodations or sufficiently modified curricula (Stenhoff et al., 2020). Because of these challenges, the need for effective and inclusive virtual learning resources (such as computer-based interventions, virtual learning environments, and game-based learning) for individuals with ASD and behavioral challenges and those who support them is substantial

(Averett, 2021; Schuck & Lambert, 2020). Khowaja et al. (2020) suggest a need for computer-based interventions (CBIs), which include a variety of learning modalities such as images, texts, and audio. The authors determined that CBIs were influential in developing skills for children with ASD and in generalizing those skills to real-world scenarios.

In addition to more effective training opportunities for educators implementing multimodal curricula, educators would benefit from increased availability of research around virtual learning for students with LFA and behavioral challenges. Educational technologists, program developers, and service providers such as Board Certified Behavior Analysts (BCBA) would also benefit from having research that specifically addresses the needs of this marginalized population of individuals with disabilities. Virtual learning and other technology-based interventions specifically designed for individuals with LFA and behavioral challenges, is a viable tool that could enable practitioners to provide services designed to address the most pressing issues experienced by this population of students. Not only would it help more students with LFA to access instruction and progress toward their goals, but it would also serve as an additional, potentially more effective, method of instruction for students with anxiety-related maladaptive behaviors, as experienced by some students with LFA (Averett, 2021).

Theoretical Context

This topic is rooted in Skinner's operant conditioning theory and Deutch and Deutch's late selection theory. An understanding of both theories is needed to fully grasp the underpinnings of this study. B.F. Skinner's theory of operant conditioning is one of the most prominent perspectives in behaviorism. As such, it is the originating force of the phenomenon and topic of this study. According to Skinner (1965), behavior can be manipulated by introducing a series of rewards and consequences at the appropriate time. Conditioning as a tool

for behavior modification is a prevalent theme here. Skinner posits that not only can an individual be conditioned to have a specific response when presented with a stimulus, but the strength and frequency of the desired "operant behavior" largely depend on the type of consequence that is provided after the behavior is exhibited (Skinner, 1965). Further, the theory of operant conditioning involves using positive and negative reinforcers to drive the extinction of undesired behaviors, increase the frequency of desired behaviors, or eliminate the emotional attachment to a behavior.

The theory of operant conditioning was pivotal to the development of positive behavioral support systems such as Applied Behavioral Analysis (ABA). ABA is an intervention where "operant conditioning establishes functional relations between behaviour, its consequences, and antecedent stimuli" (Bąbel, 2020, p. 904). ABA is most known for its use with individuals with ASD. ABA applies the constructs of operant conditioning to develop coping and communication skills, modify behavior, and improve social-emotional skills for individuals with ASD. ABA has been vetted as a research-based intervention with the potential to provide similar positive results for students with LFA in virtual learning environments.

The late selection theory offers a preceding step to the theory of operant conditioning. This theory addresses the concept of selective attention. According to Deutsch and Deutsch (1963), the late selection theory suggests that attention is a process in which sensory information is received, meaning is assigned, and then the most pertinent inputs are filtered and passed on for further cognitive processing. From this, it can be assumed that all sensory information is initially received by an individual and assigned some meaning. Based on the process of proceeding selectively or filtering, an appropriate response to the input can then be determined. According to Murphy et al. (2016), previous studies on conditioning responses have demonstrated that sensory

"perception is of unlimited capacity and proceeds automatically, processing relevant and irrelevant stimuli indiscriminately" (p. 1317). These studies indicate a possible cyclical relationship between operant conditioning and late selection theory, whereby all information is perceived, but only those behaviors that have resulted from beneficial information are reinforced.

Together, operant conditioning and late selection theory are critical considerations for understanding the sensory and behavioral challenges that many individuals with ASD experience daily. The sensory difficulties that are experienced by individuals with more severe forms of ASD play a large part in challenges related to their successful social functioning and can, in turn, cause them to display maladaptive behaviors. By understanding the connection to the theories of operant conditioning and late selection, possible opportunities to "hijack" the nervous system by giving a manufactured meaning to specific stimuli that may be introduced in an unfavorable or high anxiety-inducing social situation become more evident. This conditioned perceptual response can then influence the stimuli selected for further processing. This process whereby operant conditioning and late selection principles are applied are the building blocks to understanding how hypersensitivity and hyposensitivity to sensory information profoundly impact the lives of many individuals with LFA and cause many individuals with LFA to struggle with RRBs. The proposed study aims to refine educators' understanding of sometimes unseen catalysts of challenging behaviors and to provide a more acute description of the behavioral supports that are needed within online learning environments.

Problem Statement

The problem is that students with LFA (ASD with Intellectual Disability [ID]) and behavioral challenges who participate in virtual learning programs do not have access to the same evidence-based practices as their peers (Russell et al., 2019). Prior research conducted on

this topic indicated that individuals with ASD and ID were under-recruited among all subcategories of ASD research and accounted for less than 10% of all ASD participants (Russell et al., 2019). Considering that 56% of individuals with ASD have ID or other borderline-designating comorbidities, this indicates a low inclusion rate of study participants with LFA (Autism Speaks, 2022; Tomaino et al., 2022). Further, although ASD diagnoses have increased by more than 240% (based on the CDC and Autism and Developmental Disabilities Monitoring Network [ADDM] data), research involving individuals with LFA has decreased in the same amount of time (Maenner et al., 2020; Stedman et al., 2018). This information represents a gap in the literature regarding evidence-based support for students with LFA across multiple educational programs, specifically within virtual learning programs.

In a world where COVID-19 emergency mandates have prompted the sudden transition of students and staff to distance learning, many of the gains in virtual education that have been made because of this have lasted after the mandates have ended. The students and staff have returned to the brick-and-mortar settings. Some of these changes include developing curricular materials that better support 21st-century learning. These materials are more personalized and purposeful, delivering new avenues to implement accommodations and deliver instruction more effectively. They also create new opportunities to effectively support student independence through synchronous and asynchronous learning (Zhao & Watterston, 2021). There is great potential for students with high support needs to benefit from virtual learning, which includes increased interactivity and collaboration with educators and specialists, accessibility of instructional content, and increased flexibility of instructional space and scheduling (Chowdhury et al., 2021). In 2018, 21% of all public schools and 13% of all private schools offered at least one online course; in 2020, the percentages increased to 77% and 73% respectively (National

Center for Education Statistics, n.d.). Today, many students have not returned to in-person instruction and have instead opted for alternatives to the traditional public school setting (D'Souza, 2023). In light of the increase in online learning, prolonged benefits of online instruction, and lack of research involving students with LFA who attend school online, it is evident that the available research is not an accurate indication of the prioritizing of needs for individuals with LFA (Russell et al., 2019). As students who often require more substantial support within the learning environment, it is vital that individuals with LFA actively contribute to research supporting evidence-based practices (EBPs) that are designed to help them to be successful as 21st-century learners.

Purpose Statement

The purpose of this transcendental phenomenological study is to describe the perceptions of Special Education Teachers regarding positive behavioral supports for students with LFA and behavioral challenges who participate in virtual learning environments. At this stage in the research, positive behavioral support will be generally defined as strategies or interventions designed to either reduce maladaptive or problematic behaviors or increase preferred behaviors by addressing the elements from which problematic behaviors originate (Lindor et al., 2019). The theory guiding this study is Thorndike's (1913) associative learning theory (including the laws of exercise, readiness, and effect). In line with this theory, the study explores how to address the challenging behaviors presented by some individuals with LFA within virtual learning environments. This theory offers a structure for positive behavior development and support for addressing the determining factors of maladaptive behavior among individuals with LFA.

Significance of the Study

This study makes several significant contributions to the field of special education. The following includes a brief description of the theoretical significance of the study. A comparison between other similar studies reveals the empirical significance of the study. A description of the practical significance of the study is provided to explain how the participants and various people groups can benefit from the study.

Theoretical

The current study contributes to the theoretical underpinnings of the problem by presenting a structured method by which the theories supporting behavior modification interventions can be effectively and practically explored. Although theories such as Skinner's theory of operant conditioning and Thorndike's association theory are some of the most significant proponents of well-established EBP such as ABA, additional research involving specific vulnerable populations is needed. Carefully and ethically implemented studies, in which the tenets of operant conditioning and association theory are observed within virtual academic settings, are required to further the discussion surrounding this topic. More specifically, the study aims to describe the elements of Thorndike's (1913) learning theory (i.e., habituation) and Skinner's (1965) theory of operant conditioning (reinforcement of desired and undesired behavior) as it relates to educational success for students with LFA participating in virtual learning.

Empirical

This study adds to the literature supporting EBP for marginalized individuals with disabilities. It aims to expand the areas of impact for which evidence supports virtual learning for individuals with the most severe disabilities, including sensory and behavioral challenges. This

study is positioned to address the gap in the research for students with LFA and behavioral difficulties. It expands on the current knowledge regarding ABA-based interventions implemented within virtual learning programs by exploring the perceptions of educators and teachers of students with LFA and behavioral challenges. This study gives further credence to the idea of implementing strategies that require the systematic and incremental involvement of multiple modalities to support habituation and the inclusion of students with LFA both during the study and in the recruitment stages of research (Russell et al., 2019; Vélez-Coto et al., 2017). It also serves as a follow-up to studies by Lindor et al. (2019) and Neely et al. (2021) by exploring the problem as it exists among high school students with LFA and concerning specific elements of positive behavioral supports within the virtual learning environment.

Practical

This study could be used to accomplish several practical goals for individuals with LFA. First, it would allow teachers to provide input regarding the behavioral supports regularly implemented for students with LFA in virtual learning environments. It would also be used to inform research supporting the development of EBP for high school students with LFA. Educators participated in focus groups and reflected on the behavioral modification strategies and other inclusive services and supports that have been implemented within the students' virtual class. Because participants within the focus groups were similar and cooperative when sharing their experiences, they were able to discuss various elements of the behavioral interventions as they relate to the learning process and glean valuable insights and tips from one another. This study supports 21st-century learners with intellectual disabilities and behavioral challenges by providing an outline of the essential elements for the implementation of technology-based learning. As individuals with challenging behavior learn to cope and better manage their sensory

and social-emotional issues (including anxiety), they will experience less severe and less frequent instances of restricted and repetitive behaviors (Jiujias et al., 2017). As this occurs, it will improve familial relationships and overall enjoyment of life for the individual with a disability.

Research Questions

Current times demand that new inclusive educational supports be developed for all types of virtual learners. Educational supports in virtual learning is especially vital for marginalized students such as those with LFA and behavioral challenges. The studies exploring how this population of learners can be supported within virtual learning environments validate the notion that benefits may be gained for this population. For example, Thorndike's first three laws of learning (law of readiness, law of effect, and law of learning) may be specifically applicable to addressing challenging behaviors within the virtual learning environment (Chyung & Vachon, 2013). In that vein, this study aimed to explore the lived experiences of teachers of students with LFA who participate in virtual learning environments. Insights were gained through exploring teacher perceptions regarding the supports that address the root causes of maladaptive behaviors among students with LFA.

Central Research Question

What are the shared experiences of Special Education Teachers who implement positive behavioral supports (PBS) for students with LFA and behavioral challenges who participate in an academic virtual learning environment?

Sub Question One

How do teachers experience the essential components of readiness among students with LFA in an academic virtual learning environment?

Sub Question Two

How do teachers experience the essential components of exercise among students with LFA in an academic virtual learning environment?

Sub Question Three

How do teachers experience the essential components of effect among students with LFA in an academic virtual learning environment?

Definitions

1. *Evidence-Based Practice*- Interventions that "have demonstrated positive effects for many students across different studies (Russo-Campisi et al, 2017).
2. *Hypersensitivity*- The "suboptimal extraction of meaningful signals" (Nakajima et al., 2019, p. 488).
3. *Hyposensitivity*- "Lowered responsiveness to sensory stimuli" (Bijlenga et al., 2017).
4. *Low Functioning Autism (LFA)*- Autism with "minimal verbal ability (MV), developmental regression (R), and intellectual disability (ID)" (Chakrabarti, 2017, p. 436).
5. *Maladaptive Behavior* – "Behaviors that are suboptimal or dysfunctional" and highly aggressive (R.R. Miller & Polack, 2018; Rattaz et al., 2018).
6. *Response*- A behavior that occurs after a stimulus is introduced (Skinner, 1965).
7. *Restricted and Repetitive Behaviors (RRB)*- "Frequent behaviors that occur in a manner that is both inappropriate to the situation and odd in context" (Jiujias et al., 2017, p. 944).
8. *Stimulus*- Environmental cue (Clark & Chandler, 2018).
9. *Virtual Learning*- Learning primarily through the use of technology (also known as distance learning) (Almarzooq et al., 2020).

Virtual Learning Environment- Learning by interacting with technology that engages the five senses "allowing for a kinesthetic approach to learning" (Freina et al., 2016, p. 195).

Summary

The study highlighted a prevailing issue that many individuals with LFA experience throughout their education. Students with LFA and challenging behaviors do not benefit equitably from EBPs (Russell et al., 2019). From individuals with LFA being underrepresented in the bulk of research involving individuals with ASD to a lack of access to educational and behavioral support, students with LFA have an empirically demonstrated need for supports. The study aimed to describe the experiences of Special Education Teachers regarding positive behavioral support for students with LFA and behavioral challenges who participate in virtual learning environments. Because virtual learning environments have the potential to offer significant gains for students with LFA and behavioral challenges, efficacious supports are needed to provide access and promote success for students with LFA who also desire to benefit from a tool that today impacts the lives of almost every learner attending an educational institution.

CHAPTER TWO: LITERATURE REVIEW

Overview

Today, virtual learning is a tool that impacts the lives of almost every learner attending an educational institution. For individuals with disabilities, virtual learning has allowed them to continue to receive the support they need to overcome their most significant disability-related challenges. Although evidence-based practices and interventions are available, students with LFA and challenging behaviors have been largely excluded from the plethora of research about the effects of virtual learning. Research involving the educational professionals who support these students is also lacking. This chapter provides an outline of current research involving students with ASD in virtual education programs and the perspectives and experiences of the educators who support them. Issues related to the types of supports and services available to students with LFA and the preparedness of educators within these programs will be discussed. More specifically, this chapter will address issues related to behavioral supports for students with LFA specific to restricted and repetitive behaviors (RRBs), maladaptive behaviors, sensory processing deficits, sensory sensitivity, positive behavior supports, and virtual learning environments. By examining the issue through the theoretical framework of Thorndike's associative learning theory, more effective ways can be discovered to support educators in addressing the behavioral needs of individuals with LFA and challenging behavior.

Theoretical Framework

The theoretical framework for this study provides a basis for understanding how the issue can be addressed. Unlike the theoretical underpinnings of the phenomenon, the theoretical framework provided a roadmap that guided the researcher to a means of moving forward after having studied the phenomenon. Although there may be similarities between many behavioral

theories available to explain this phenomenon, the current study employed the theoretical concepts of Thorndike's associative learning theory. Critical disability theory, as viewed through Foucault's discourse, is discussed to add context regarding the relevancy and applicability of Thorndike's associative learning theory and students with LFA. However, the crux of this framework and the theory through which teacher perspectives were explored rests in Thorndike's associative learning theory.

Thorndike's Associative Learning Theory: Connectionism

Edward Thorndike was a psychologist who studied comparative psychology and the learning process at Columbia University (Galef, 1998; Tomlinson, 1997). During his time there, Thorndike took an interest in the work of C.L. Morgan and George Romanes in which they asserted that the animals they studied (dogs and cats) learned to open gates through repeated trial and error and by watching humans operate a latch and then associating that action with the consequence of escaping the confines of the gate (Galef, 1998). In 1910, Thorndike developed his theory of connectionism after considering this and conducting his own studies on the associative learning process. Thorndike's theory of connectionism suggests that learning is the result of connections that have been made between stimuli and responses. The three main concepts driving this theory are the laws of readiness, exercise, and effect. These tenets are known as the laws of learning (Galef, 1998).

As a substantial tenet of the connectionism theory, the law of readiness asserts that every organism acquires changed behavior based on its perception of the learning task (Anindyarini et al., 2018; Islam, 2015). The law of exercise posits that repetition and practice are the most critical factors in learning. Lastly, the law of effect suggests that when introduced to a satisfying stimulus, an individual is more likely to repeat a specific action or produce a particular response.

Conversely, when introduced to an undesired stimulus, an individual is less likely to produce an action or response associated with the introduction of the stimulus.

Thorndike's (1913) theory of learning, specifically the laws of learning, has implications for behavior modification interventions for individuals with ASD. The law of effect closely resembles Skinner's theory of operant conditioning, which has formed the basis for current ABA practices, yet training in this area has been insufficient or lacking for many educators of students with ASD. In addition to behavior modification and teacher training implications, Thorndike's connectionism theory may specifically serve as a vehicle for addressing the needs of students with ASD within the virtual learning environment. Each of the laws is uniquely set up to address a specific area of deficit for the student with ASD.

For example, the law of exercise touches on habituation and sensitization, an area of deficit for many individuals with LFA, as it explains that repeated exposure to a stimulus can increase neural habituation and improve social impairments (Thorndike, 1913). Further, the law of exercise indicates that a response connection can be formed through repeated exposure to the same or similar stimuli. This has implications for anxiety reduction for individuals with ASD in social situations. The law effect may be used to address the challenging behaviors that are sometimes demonstrated by individuals with ASD as it suggests that behavioral responses can be modified by the strategic introduction of positive and negative reinforcements. This has implications for professional development programs and ABA-specific training for educators of students with ASD. Lastly, the law of readiness addresses the sensory processing difficulties and adaptability of individuals with ASD in that it asserts that preparation efforts may be capitalized on to build positive associations of the perceived learning task (Anindyarini et al., 2018). The same law has implications for educator preparedness and teaching effectiveness as well.

Foucault's Discourse on Critical Disability Theory

Thorndike's connectionism theory does well to explore the behavioral facets of human nature and the social good with regard to the learning process, and his conclusions can be applied to people with disabilities in general. His ideas about learning lean on the notion that learning is a result of behaviors that must be acquired or developed at an individual level and that this is true for all learners. Contrary to Thorndike's belief that the prevalence of external stimuli is the agent that supports or hinders learning for all, critical disability theorists would argue that learning is a multifaceted skill that is largely affected by student-related pathologies. Critical disability theorists oppose the social model of disability which views an individual's disability as a result of environmental factors that influence all students equally (Anders, 2013; Gibson, 2020). Instead, disability is described in terms of the specific medical impairment.

One tenet of critical disability theory addresses the social aspects of disability and power. In this regard, Foucault's discourse on critical disability theory poses the idea of biopower. He viewed the management of disability as historically coming from a place of hyper-politicization. For Foucault, it was apparent that the societal perceptions and treatment, of people with disabilities, were closely tied to a larger systemic agenda aimed at appeasing those in power rather than increasing autonomy for the individual with a disability (Anders, 2013; Hewitt, 2022; Tremain, 2001). Biopower essentially transforms people with disabilities into subjects by de-normalizing impairment and making people with disabilities manageable objects rather than equally contributing members of a society with all accompanied rights (Burghardt, 2011). Foucault's analysis of this power complex is most aptly summed up as his attempt to address inclusion and the right to life issue that affects people with disabilities.

As the collective tenets of Thorndike's connectionism theory and the Foucaldian view of the right to life are considered, it becomes necessary to explore how educating students with disabilities can be supported in a way that provides autonomy, inclusion, and social equity. Thorndike's learning theory, being the theoretical lens through which this issue will be explored, has the potential to address the specific medical issues that are often experienced by individuals with LFA. As the pathologically-sourced needs of individuals with disabilities are addressed, the potential to support successful adaptation, engagement, and contribution becomes clear. By strategically testing the essential tenets of Thorndike's connectionism theory, namely the laws of learning, an improvement in the type, administration, and efficacy of supports that are available for students with LFA would be possible. The information gained through this study also has the potential to transform educator training programs to be more effective in addressing the needs of students with LFA that are specifically related to their pathological impairment.

Related Literature

The implementation of EBP's as a means of educating students and shaping young minds and behaviors is the expectation of many educational institutions (Knight et al., 2019). Not only should EBP's inform educator teaching practices and the type of environment that is created for the students, but they should also inform the content of professional development opportunities for educators. Although this is the intent of many special education programs it is not always effectively actuated. Since the COVID-19 stay-at-home mandates prompted the need for distance learning, many educators have reported feeling unprepared or inadequately trained on how to support their students with disabilities in an online setting (Larraceleta et al., 2022). Some have resorted to implementing supports based on information that was gained incidentally or outside of teacher trainings, which in many cases was incorrect information, while others have taken to

reducing the quality or quantity of supports by making such changes as reducing service minutes or eliminating social goals (Fennel & Dillenburger, 2018; Hurwitz et al., 2022; Larraceleta et al., 2022). Appropriate, effective, and specific evidence-based teacher training is especially important to providing specialized services to any marginalized group of students. For educators to effectively meet the needs of students with LFA and behavioral challenges who participate in virtual learning environments, efficacious teacher trainings must be provided on topics such as ASD, behavioral symptoms of ASD, functions of behaviors, behavior modification, and virtual learning for students with LFA.

Autism Spectrum Disorder

ASD is a developmental disability in which individuals exhibit "social communication deficits and repetitive and unusual sensory-motor behaviours" (Lord et al., 2018, p. 508). The American Psychiatric Association's (2022) Diagnostic and Statistical Manual of Mental Disorders Text Revision (5th ed.; DSM-5 TR) includes specific criteria indicating a potential diagnosis of ASD. For a diagnosis of ASD according to the DSM-V-TR, an individual must possess at least two of the following restricted and repetitive behaviors:

(1) Stereotyped or repetitive motor movements, use of objects, or speech. (2) Insistence on sameness, inflexible adherence to routines, or ritualized patterns of verbal or nonverbal behavior (3) Highly restricted, fixated interests that are abnormal in intensity or focus (4) Hyper- or hypo-reactivity to sensory input or unusual interest in sensory aspects of the environment. (American Psychiatric Association, 2022).

Several factors affect the prevalence rates of ASD diagnoses and distinguish it from social communication disorder including ethnicity, gender, and age (Masi et al., 2017). According to the Centers for Disease Control and Prevention, the prevalence estimates for

children aged 8 years is 1.68% (Fombonne, 2018). The author notes that this number has steadily increased from 0.4% since the 1960s. Currently, ASD is said to directly affect between 1% and 2% of the population across all ages with 1 in 44 children being diagnosed with ASD (American Psychiatric Association, 2022 , p. 59; Maenner et al., 2020). Males are four times more likely to be diagnosed with ASD than girls. White children have the highest rate of ASD diagnoses (1.3%) while African American and Latino American children have lower rates (1.1% and 0.8% respectively).

Additionally, although there is some variability according to location, Hispanic and non-Hispanic Black children are diagnosed with ASD and ID at higher rates than White children, with non-Hispanic Black children showing the highest prevalence rate and 30% more likely to be diagnosed with ASD and ID (Maenner et al., 2021). Because of this steady rise in the number of ASD diagnoses and the disproportionate ratio of ASD prevalence among Hispanic and non-Hispanic Black male children, ASD is an area of study that is in constant need of new and effective research-based interventions. Because of the myriad of variability in symptoms and the severity of symptoms that are experienced among individuals with ASD, interventions must be available to support students across the whole spectrum of ASD diagnoses, and not primarily for those with the mildest forms of ASD. Mardiyanti (2016) explains that because of the unique needs of every child with ASD, the focus must be placed on how the child learns rather than on the learning challenges that are presented. However, knowing what pathologies and challenges are associated with ASD can provide some context for understanding how to effectively support student learning.

To create a more precise description of ASD pathology, the American Psychiatric Association (2022) has expanded its original text to include updated descriptions of ASD,

including a revision of its diagnostic features and updated terminology used to specify the severity of ASD. American Psychiatric Association's (2022) Diagnostic and Statistical Manual of Mental Disorders Text Revision (5th ed.; DSM-5-TR) , ASD is described as a disorder in which there are “persistent deficits in social communication and social interaction across multiple contexts, as manifested by” deficits in social-emotional reciprocity, nonverbal communicative behaviors used for social interaction, developing, maintaining, and understanding relationships (p. 56). A diagnosis of ASD must also include a demonstration of restricted, repetitive behaviors as manifested by stereotyped or repetitive motor movements, insistence on sameness, highly restricted interests, and/or hyper- or hyposensitivity to sensory input (American Psychiatric Association, 2022), p. 56-57). Additionally, these symptoms must be present in early childhood, preclude significant impairment to an individual’s level of functioning in at least one area, and exceed the impairments that may be explained by a diagnosis of intellectual developmental disorder.

Comorbidity in ASD

It is not unusual to have a comorbidity of disorders with a diagnosis of ASD. Previous versions of the DSM included diagnostic criteria for several separate neurodevelopmental disorders with symptomologies that have been folded into the current diagnostic criteria for ASD (such as Asperger's syndrome, childhood disintegrative disorder, and pervasive developmental disorder-not otherwise specified) (Rosenberg et al., 2009). The presence of current separate disorders such as ID and language disorder adds to the variability and severity of verbal and non-verbal deficits in social communication, which is one of the most pervasive areas of deficit for many individuals with ASD (American Psychiatric Association, 2022). The combined effects of

symptoms from comorbid diagnoses as well as the variability in autism symptomology are some of the reasons that ASD is considered to be a spectrum disorder.

Comorbidity can present non-ASD symptoms that create challenges in social communication or restricted, repetitive behaviors (such as language impairment and generalized anxiety disorder), or they can add to the intensity of currently held ASD deficits (American Psychiatric Association, 2022; Kim, 2015). Other disorders that are often associated with ASD include catatonia, language disorder, intellectual developmental disorder, attention-deficit/hyperactivity disorder (ADHD), anxiety disorder, depression, and avoidant/restrictive food intake disorder. One study found that children with ASD may have up to four additional psychiatric disorders and that the most prevalent of these non-ASD disorders is ADHD (Ivanović, 2021). In a meta-analysis identifying comorbidity rates among individuals with ASD, Lugo-Marin et al. (2019) found that nearly 60% of individuals with ASD also had comorbid disorders. Along with the previously stated disorders, clinical specifiers and associated features represent medical conditions (elements of previous and current disorders) that when present can also increase the level of severity and required supports for individuals with ASD- all adding to the variability that is typical among individuals on the spectrum.

ASD Severity

In addition to variability in individual characteristics of ASD such as ASD severity, language ability, and IQ variances may also be noticed in adaptive behavior (Bal et al., 2017). According to the American Psychiatric Association's (2022) *Diagnostic and Statistical Manual of Mental Disorders Text Revision* (5th ed.; DSM-5-TR), ASD diagnoses are generally classified into 3 categories- Levels 1, 2, and 3. Each level is distinguished by symptom severity and the level of support needed for the individual to function successfully compared to non-disabled

peers. Individuals diagnosed with a level 1 classification are considered to require the least amount of support. Individuals with a level 2 symptom severity diagnosis are said to require substantial support, and those with a level 3 severity diagnosis require very substantial support. In addition to increased levels of support, ASD level severity is marked by increased deficits in social communication and restricted and repetitive behaviors with level 3 including the most severe deficits (American Psychiatric Association, 2022). Typically, ASD is discussed using the more commonly used terms (high and low functioning) with low functioning demonstrating more severe deficits and increased supports (levels 2-3), and high functioning demonstrating symptoms that are decreased in intensity and frequency (levels 1-2).

It should be noted that although a level 2 ASD diagnosis denotes symptomology that is indicative of an individual with ASD who requires substantial support, there is no commonly used term for this level of ASD. Within educational environments (i.e. educational institutions, academic and behavioral intervention programs, etc.) individuals with ASD are generally described as having either moderate-severe ASD (levels 2-3) or mild-moderate ASD (levels 1-2) according to their level of functioning. The type of special education program within which these individuals are placed would include the same labeling. For example, previously, individuals with low functioning ASD were considered to represent those who had a comorbid diagnosis of intellectual disability, and they would often be placed in a moderate-severe special education program. Individuals with high functioning ASD were considered to be those without a severe intellectual disability and they would often be placed in a mild-moderate special education program (Alvares et al., 2020).

There is some disagreement regarding the terms that are used when referencing ASD severities. It is a question of describing an ASD diagnosis in terms of level (1-3) or functioning

(low or high). de Giambattista et al. (2018) explain that between high functioning ASD and Asperger's Syndrome "autistic core features (i.e. deficits in social communication and social interaction and restricted, repetitive patterns of behavior, interests, or activities) are present, even if with subtle differences" (p. 144). Much of the opposition to the use of the terms high and low functioning comes from the stigma of being intellectually impaired which is sometimes associated with a diagnosis of ASD. Alvares et al. (2020) discovered that intellectual disability (as seen via IQ test scores) was not a sound predictor of one's level of adaptive functioning when based on IQ scores alone. The authors state that because of this, the use of descriptive terms such as "low" or "high" functioning is simply a misnomer and not clinically accurate.

Although the terms high and low functioning alone are not the best representation of functional ability for individuals with ASD, when paired with relevant specifiers (i.e. with or without accompanying intellectual impairment, associated with behavioral problems, or with or without accompanying language impairment) they are an accurate indication of the level of general support that an individual with ASD might require (Alvares et al., 2020). In addition to including specifiers in ASD descriptions, providing additional information such as age at the time of diagnosis can increase the accuracy of assumptions about one's level of adaptive functioning. Frequently, the negative affect that individuals have regarding the use of the terms high and low functioning ASD stems from inaccurate public assumptions about the individual with ASD which are often based on diagnostic descriptions that lack clearly stated specifiers (Kenny et al., 2016).

In a meta-analysis by Alvares et al. (2020), it was discovered that the terms high and low functioning ASD are still widely used among researchers and in clinical settings with only a slight decline in use in recent years. Use of the terms has persisted over the years by researchers

and trained professionals despite inaccurate public assumptions based on inadequate individual descriptions. Having a clear understanding of the commonly used educational and clinical terminology associated with ASD (high functioning, low functioning, mild-moderate, and moderate-severe) along with the inclusion of specifiers as outlined in the DSM-V-TR (with or without intellectual impairment, with or without language impairment, associated with behavioral problem, and disruptive/challenging behaviors) may be the most comprehensive way to ensure that prescriptions, interventions, and supports for individuals with ASD are appropriate and inclusive. Additionally, the use of high and low functioning ASD with all pertinent specifiers may be ideal in informing educators of the depth and severity of symptoms associated with the disorder which could reduce negative perceptions of behaviors associated with ASD (Nah & Tan, 2021). Research indicates that knowledge of the diagnostic label helps raters "to perceive the behaviours more positively" (Nah & Tan, 2021, p. 2021). In the current study, the terms high and low functioning ASD will be used to describe ASD with level 1-2 severity (high functioning ASD) and ASD with level 2-3 severity (low functioning ASD).

High Functioning Autism (HFA) and Low Functioning Autism (LFA) Symptomology

HFA is a type of ASD that is typically found in individuals "with average or above average intellectual abilities (Intelligent Quotient, IQ, higher than 70)" (de Giambattista et al., 2018, p. 139). The symptoms that accompany this type of ASD are typically milder than those found in individuals with LFA. Bujnakova et al. (2016) noted that individuals with ASD had underactive autonomic nervous systems with possible increases in severity for individuals with higher levels of anxiety or during periods of increased activity. Many individuals with HFA have developed compensation strategies to mitigate the apparent signs of social communication and interaction deficits. As a result, individuals with ASD experience higher levels of anxiety, having

to “consciously calculate what is socially intuitive” for most non-disabled individuals (American Psychiatric Association, 2022, p. 61).

Besides social communication and interaction deficits and subsequent increased anxiety, individuals diagnosed with HFA typically have poorer “cognitive and comprehension abilities” (de Giambattista et al., 2018, p. 145). Additionally, restricted and repetitive behaviors and deficits in adaptive and functional skills are also areas in which there is variability in severity. Sensory hypo- or hyper-sensitivity is still an issue for this population of individuals and can lead to an increased manifestation of restricted and repetitive behaviors. The lower intensity and frequency of ASD symptoms and designation of “requiring support’ make this group the preferred population for research on ASD.

Contrary to HFA, LFA is often associated with the prevalence of comorbidities such as anxiety, intellectual disability, sleep difficulties, and more (Masi et al., 2017). Individuals with this type of ASD typically have ASD symptoms that are more intense and frequent. According to Chakrabarti (2017), LFA is characterized by the prevalence of “minimal verbal ability (MV), developmental regression (R), and intellectual disability (ID)” (p. 436). Cohen and Flory (2019) explain that individuals diagnosed with low-functioning ASD in the preschool years typically did not show a decrease in atypical behaviors as they got older like their higher-functioning counterparts. Instead, “language and social skills either remained stable or declined” among those with LFA (Cohen & Flory, 2019, p. 1424). Because of the intensity, dependency on assistance, and challenging nature of ASD symptoms for individuals with LFA, the research involving this population is sparse, and there is a need for research-based interventions related to virtual learning for students with LFA.

Behavioral Symptoms of ASD

Along with deficits involving social communication, increased anxiety, and the prevalence of various comorbidities, another aspect of ASD symptomology is seen in the prevalence of restricted and repetitive behaviors (RRBs), which are a category of symptoms described as being linked to ASD diagnoses. According to Jiujias et al. (2017), RRBs are "defined as frequent behaviors that occur in a manner that is both inappropriate to the situation and odd in context" (p. 944). Lidstone et al. (2014) explain that RRBs are divided into two categories: insistence on sameness (IS) and repetitive sensory and motor behaviors (RMB), with IS behaviors being significantly associated with anxiety. Some examples of stereotyped or repetitive motor movements include flipping objects, echolalia, lining up toys, or idiosyncratic phrases (American Psychiatric Association, 2022). Examples of insistence on sameness or inflexibility in routine include greeting rituals, distress at small changes, and difficulties with transitions (American Psychiatric Association, 2022).

Further, the American Psychiatric Association (2022) provides additional categories of RRBs that are typical among individuals with ASD. "Highly restricted or fixed interests" and "hyper-or hypo-reactivity to sensory input" are also RRB-related symptoms that can manifest with varying degrees of intensity and frequency (American Psychiatric Association, 2022, p. 57). Highly restricted or fixed interests can be manifested as an abnormal or intense interest in something or a strong attachment or preoccupation with something (American Psychiatric Association, 2022). Some examples of hyper- or hypo-reactivity found in individuals with ASD include an "indifference to pain/temperature, adverse response to specific sounds or textures, excessive smelling or touching of objects, visual fascination with lights or movement" (American Psychiatric Association, 2022, p. 57). The restricted interests and repetitive

sensorimotor behaviors are often associated with the social and functional impairments that are typical of individuals with ASD. Additionally, inadequately addressed RRBs can increase in intensity and/or frequency and lead to the manifestation of maladaptive behaviors.

The frequency and intensity of RRBs and the presence of intellectual disability play a part in designating an individual as having either high or low-functioning autism (Masi et al., 2017). RRBs can be exhibited before a diagnosis of ASD is attained, and because of this, they are thought to be precursors to a diagnosis of ASD (Jiujias et al., 2017). RRBs such as flapping hands, spinning objects, and insistence on sameness are considered non-aggressive RRBs. In addition to these non-aggressive behaviors, individuals with more severe forms of ASD or who require more support may also exhibit more aggressive and pervasive maladaptive behaviors.

Maladaptive Behaviors

Maladaptive behaviors are defined as behaviors that are suboptimal or dysfunctional (R.R. Miller & Polack, 2018). In other words, maladaptive behaviors are those that hinder individuals with ASD from adapting to situations and events and from completing tasks. They "include irritability, lethargy, hyperactivity, and repetitive behaviors" (Dellapiazza et al., 2020, p. 2144). Maladaptive behaviors do not always align with the idea that behaviors are meant to serve an adaptive function.

Maladaptive behaviors are not exhibited in all individuals with ASD. They are more typical among individuals with LFA (R.R. Miller & Polack, 2018). However, in individuals with ASD, maladaptive behaviors are challenging or problem behaviors that include "a varying degree of irritability, destructiveness, aggression, withdrawal, lethargy, uncooperativeness, hyperactivity as well as repetitive behaviours or self-injury" (Rattaz et al., 2018, p. 638). In the classroom, students who engage in maladaptive self-stimulating, sensory-seeking behaviors

(such as biting oneself, or excessive rocking back and forth) may be hindered from accessing instruction because of their inability to sit for long periods. They may also pose a more immediate threat, such as physical harm done to oneself or by exposing others to bloodborne pathogens. Maladaptive escape and avoidance behaviors may interfere with learning by hindering progress because of repeated refusals to complete undesired tasks. Escape and avoidance behaviors may also inadvertently reinforce deficits related to physiological hyper- or hypo-sensitivity and communication, further impeding learning within the educational environment and the functioning of the community and the home.

Although these escape and avoidance behaviors and other emotional and behavioral issues are generally not associated with ASD severity level, RRB severity is related to social communication severity (Mazurek et al., 2019). For many individuals with ASD, the inability to effectively communicate one's wants and needs and to express oneself can be a catalyst for increased anxiety and RRBs. These deficits in social communication can cause problems such as social interaction and challenging behaviors (Wattanawongwan et al., 2022). Whether the deficit is related to one's social communication and interaction skills or restricted and repetitive behaviors, they often stem from biochemical abnormalities or processing difficulties.

Biochemical Makeup and Maladaptive Behaviors**.** One biochemical deficit that may be seen in individuals with ASD is lower than normal plasma levels of beta-endorphins, which may cause increased irritability or excitability and subsequent engagement in self-injurious behaviors (Sandman et al., 1991). Another biochemical deficit that may be seen in individuals with ASD is a reduction in gamma-aminobutyric acid (GABA), which also aids in balancing excitability (Marotta et al., 2020). This author also states that although the cause of ASD is largely unknown, more studies are showing that ASD etiology is multifactorial. Along with these biochemical or

genetic abnormalities, ASD symptoms may also stem from environmental factors and processing difficulties.

Sensory Processing and Maladaptive Behaviors**.** Difficulty in sensory processing is a hallmark of ASD for most individuals with ASD. More specifically, many individuals with ASD and challenging behaviors also have atypical sensory processing abilities (Dellapiazza et al., 2020). Studies have shown that atypical sensory processing is linked to maladaptive behaviors in that it is commonly considered a risk factor for behaviors such as self-injury and increased RRBs (Nieto et al., 2017).

It is necessary to define sensory processing to understand the connection between sensory processing difficulties and maladaptive behaviors. Dellapiazza et al. (2020) describe sensory processing as a process that "allows the selection, organization, and association of various types of sensory information from the environment (to) help to adapt human behavior" (p. 2142). They further explain that impairment in this area inhibits the individual from successfully adapting to various situations, changes, and events. This inhibition is manifested in several ways including hyper- or hypo-reactivity, increased or abnormal sensory interest, and enhanced sensory perceptiveness (Ausderau et al., 2014). Research consistently confirms the link that exists between maladaptive behaviors in children with ASD, social communication skills, severity of ASD symptoms, sensory processing, and intellectual ability (Nagai et al., 2017).

The idea of sensory-processing difficulties is closely associated with social communication deficits in individuals with ASD, leaving them unable to communicate or receive information effectively inhibits understanding of interactive communications and environmental factors. This lack of understanding inhibits one from selecting a proper response to sensory input, demonstrating an individual's difficulty in responding to complex social cues, such as

when to join a conversation or recognizing when someone is sad and does not want to be approached (American Psychiatric Association, 2022). Mazurek et al. (2019) explain that social communication deficit severity is associated with the severity of RRBs. The effects of social communication deficits are compounded when an individual with ASD also experiences hyper- or hyposensitivity to sensory information.

Hypo- and Hyper-Sensitivity and Maladaptive Behaviors**.** Sensory information includes the plethora of environmental stimuli that are encountered daily. The information we perceive through our senses helps us understand the world around us, and we use these environmental clues to navigate the world and respond to people. For many adolescents with ASD, issues surrounding hyper- and hypo-sensitivity are a genuine threat to their ability to function even when engaging in simple tasks. Although not all sensory-seeking or sensory avoidance behaviors are maladaptive, depending on their intensity, frequency, and duration, these behaviors can escalate and become maladaptive. Hyper- and hypo-sensitivity related behaviors become maladaptive only when they interfere with adaptive functioning (McCormick et al., 2016).

Such responses to these sensory challenges are "manifested through extreme responses to specific sounds or textures, excessive smelling or touching of objects, fascination with lights or spinning objects, and sometimes apparent indifference to pain, heat, or cold" (American Psychiatric Association, 2022, p. 62). It can also include sensory-seeking behaviors such as "prolonged visual inspection of toys or repetitive touching of objects" (McCormick et al., 2016, p. 572). This physical response to one's hyper- or hypo-sensitivity can often be a precipitating factor to hyper- hypo-reactivity, which involves having an extreme reaction to taste, smells, textures, or even the appearance of food and other objects.

Hyper- and hypo-reactivity to stimuli are often associated with RRBs and challenging behavior among individuals with ASD. When participating in school or public settings, one has less control over their environment and the frequency and intensity of experienced stimuli. Lack of control over environmental stimuli and difficulties processing such stimuli can increase RRBs and maladaptive behaviors. Understanding the social communication and sensory processing issues that individuals with ASD may experience and determining the function of maladaptive behaviors allows educators to be aware of the specific pathology-related needs of the student. It also helps scientists and educators to understand how improving social communication and addressing environmental factors (sensory) can reduce maladaptive behaviors among adolescents with ASD and challenging behaviors (Wattanawongwan et al., 2022).

Functions of Behavior

Scientists agree that all behavior generally serves a function. When the idea of cause and effect is considered a functional relationship whereby a cause causes an effect, the relationship between a stimulus and a behavior becomes more apparent (Skinner, 1965). As such, the maladaptive behaviors that individuals with ASD sometimes exhibit are primarily a function of some cause or stimulus. Skinner defines a stimulus as a thing or situation that controls or prompts a specific functional reaction known as a behavior or response (Skinner, 1965). Thus, a behavior, whether adaptive or maladaptive, is a function of some stimulus being introduced. The stimulus catalyzes the behavior.

A clear description of how a behavior manifests within the learning environment and how the learning process is hindered must first be provided to identify the function of the behavior. Some examples of challenging behaviors among individuals with ASD included self-injurious behaviors (such as biting the wrist or hand, banging or hitting the head, and self-scratching),

avoidance behaviors (such as refusing to complete work, not making eye contact, and refusing to speak or respond, and leaving the area), and anger or aggressive outbursts (such as tantrums, yelling and screaming, and physically acting out [hitting, kicking, throwing objects, spitting]) (Dominick et al., 2007; Fulton et al., 2014; Griffin et al., 2022). It is also important to understand the function of the behavior and how to address it adequately. For example, as McCormick et al. (2016) mentioned, some behaviors result from an individual's attempt to address a hyper- or hypo-sensitivity to stimuli like avoidance, eloping, refusal, compulsions, and repetition. While some maladaptive behaviors may be the direct result of physiological impairments such as sensory processing issues or language disorders, challenging behaviors typically fall into any of four functional categories (escape/avoidance, sensory-seeking [including self-stimulation/automatic reinforcement], and access to tangibles/attention) (Hong & Matson, 2021; Neely et al., 2021; Romani et al., 2023).

Communication-Related Behaviors

Social communication deficits are one area of physiological impairment from which many maladaptive behaviors function. Anxiety that occurs as a result of an inability to communicate effectively or as an attempt to communicate can manifest in RRBs (Rattaz et al., 2018). Mazurek et al. (2019) explain that the severity level of RRBs is associated with the severity level of social communication. As maladaptive behaviors are a severe form of RRBs, the link between social communication and maladaptive behaviors is evident. The authors also identified an association between the severity of RRBs, the severity of social communication, and the level of intellectual functioning. Students with LFA typically experience severe deficits in social communication, which can cause severe impairments in functioning. In the educational

environment, maladaptive behaviors that are a result of social communication issues typically begin with anxiety and frustration due to not being able to communicate effectively.

The frustration frequently associated with the inability to communicate a want and need can sometimes manifest as maladaptive or seemingly maladaptive behaviors. When observable behaviors manifest, they can fall into any core functional categories of behaviors (i.e., avoidance behaviors, access behaviors, etc.) and impede learning. While some maladaptive behaviors stem from anxieties related to an inability to communicate effectively (as seen in language disorders), others may be linked to physiological impairments such as hyper- and hypo-arousal and subsequent avoidance of the often-experienced increased anxiety.

Anxiety Avoidance Behaviors

Increased anxiety due to abnormalities in physiological reactivity is one of the most pervasive causes of behavioral issues among students with ASD (Lydon et al., 2016). According to Lydon et al. (2016), "hyper-arousal is associated with experiences of fear, anxiety, and avoidance, and hypo-arousal is associated with feelings of dullness, under-stimulation, and sensory-seeking" (p. 335). Abnormalities in physiological reactivity (as seen with hyper-arousal) can affect the autonomic and sympathetic nervous systems, which can induce anxiety and internalized behaviors (i.e., withdrawal) or aggressive and disruptive behaviors. For example, McCormick et al. (2016) found that some behaviors result from an individual's attempt to address hypersensitivity to stimuli (avoidance, eloping, & refusal). When repeated, this avoidance can lead to increased anxiety over the object or situation being avoided and impaired daily functioning (Nikolić, 2020). Jiujias et al. (2017) explain that "individuals with ASD who exhibit clinical levels of anxiety report experiencing more severe and/or frequent instances of RRBs," which can become disruptive or maladaptive (p. 948). The maladaptive behaviors that

students with ASD exhibit are often an attempt to address the issues resulting from abnormal physiological reactivity (such as sensory avoidance or sensory-seeking behaviors).

Sensory Seeking Behaviors

Some challenging behaviors are categorized as sensory-seeking behaviors and are an individual's attempt to address a hypo-sensitivity to stimuli such as compulsions and repetition). Because of the hyper- and hypo-sensitivity that is often experienced by individuals with ASD, auditory stimuli such as loud noise, persistent rhythmic humming as in electronics and lights, and sudden changes in volume prompt a variety of behaviors depending on the level of sensitivity, also known as neurological threshold and responsiveness (Dellapiazza et al., 2020; Griffin et al., 2022). Some behaviors that may be observed as a result of an individual's hypo-sensitivity to auditory stimuli are hitting something hard to make a loud noise, covering the ears and humming persistently, and engaging in other RRBs such as hand flapping (Schulz & Stevenson, 2019). These behaviors are known as self-stimulatory behaviors and are automatically reinforced by the individual engaging in the behaviors. Another sensory-seeking behavior might address an individual's hypo-sensitivity to visual stimuli (i.e., having an unusual interest in fast-moving objects). Impaired global motion perception and other issues surrounding sensory impairments in the vestibular system may cause an individual with ASD and hyper-sensitivity to avoid crowded rooms (Rogers & Ozonoff, 2005). It may also cause individuals with hypo-sensitivity to seek sensory input such as loud noise, blinking or strobing lights, and physical pressure but become overstimulated in crowded spaces or while looking out of the window of a vehicle in motion (Nguyen et al., 2020). Maladaptive behaviors that occur because of these sensory processing abnormalities often result from a desire to access or avoid sensory input (Griffin et al., 2022).

Behavior and Access to Tangibles

While some maladaptive behaviors may function as an attempt to escape or avoid a stimulus (such as with anxiety avoidance behaviors and hyper-sensitivity), others may function as an attempt to access attention or tangibles or attention. One of the functional categories of ASD behavior is access to tangibles. Similar to sensory-seeking behaviors, behaviors that fall into this category indicate an individual's attempt to access something that is desired, such as attention or tangibles. Access behaviors include maladaptive behaviors that are reinforced through interaction with others and thus maintained by positive social reinforcement (Briggs et al., 2018; E.G. Carr, 1994; Newcomb & Hagopian, 2018). Maladaptive behaviors that are the result of an attempt to access a tangible item or attention, such as throwing a tantrum, crying, hitting others, or throwing objects, may interfere with learning by hindering learning for the acting-out person and others and by impeding the teacher's ability to deliver instruction. It may also cause the student to lose focus on the assignment or pose an immediate threat of physical harm to others or the acting-out person.

Maladaptive behaviors resulting from an attempt to gain attention, such as repeatedly standing up during instruction, invading personal space, or yelling/screaming, may interfere with the learning of others by creating a distraction and taking the focus off the lesson being taught. It may also hinder the individual's independent functioning or severely limit the time the individual can engage in self-driven tasks. In addition to being catalysts for maladaptive behavior, language, and sensory processing issues may also have significant roles in each of the core categories of behavioral functions (escape/avoidance, self-stimulation, and access to tangibles/attention). Several routes can and should be taken to understand the precipitating factors of behavior better. Taking a multimodal approach to understanding behavioral function (i.e., considering biological and environmental factors in addition to other data) can yield the

most accurate description of the behavioral function and related contingencies (Ala'i-Rosales et al., 2019; Briggs et al., 2018; E.G. Carr, 1994). It is essential to understand the function of the behavior and how to address it adequately.

Determining Behavior Function Through Functional Behavior Analysis

To better understand why a specific behavior exists, a functional analysis of the behavior can be conducted. Functional analysis provides a means of determining the functional relationship between the social environment and the behavior exhibited by an individual (Skinner, 1965). Skinner (1965) explains that the variables in which behavior is a function "lie outside of the organism, in its immediate environment and its environmental history" (p. 31). He also explains that although internal factors (such as biochemical abnormalities and processing difficulties) exist and are, in some way, relevant to the behavior itself, inner states are "not relevant to conducting a functional analysis" (p. 39). Unlike more reductionist approaches to determining behavioral function, conducting a functional analysis is a more holistic way of deciding the stimulus-behavior relationship in a way that applies to multiple social circumstances.

As it pertains to individuals with ASD, a functional behavior analysis (FBA) is conducted to obtain a more precise idea of the function of a particular behavior. More specifically, FBAs are "conducted in the educational environment to identify the environmental variables that maintain the target behavior" (Hong & Matson, 2021, p. 86). Here, the principles of operant conditioning are at work as stimuli within the environment are "manipulated in order to decrease challenging behaviors and increase appropriate behaviors" (Hong & Matson, 2021, p. 86). In addition to meeting sensory and communication needs, as explained by Jiujias et al. (2017) and Rattaz et al. (2018), behaviors associated with ASD may also serve as a means of gaining

attention, accessing a tangible item, escaping undesirable situations, nonsocial functioning, or physical stimulation (self-stimulatory) (Hong & Matson, 2021). Once the function of the behavior is determined, an appropriate intervention can be implemented to address it.

Behavior Modification

Interventions are implemented to modify the challenging behaviors that students with ASD sometimes exhibit. In the educational environment, maladaptive challenging behaviors can hinder the student from accessing the material and progressing. Outside of biochemical abnormalities, various stimuli presented in the academic environment can support students with challenging behaviors by aiding in reducing such behaviors. Whether the educational environment is in-person or virtual, the behaviors (response) that are exhibited by the student with ASD are a response to any number of observable, manipulable situations or variables (stimuli) that can be manipulated to modify the behavior and improve access to learning materials and academic progress (Skinner, 1965). Woo et al. (2015) suggest providing students with ASD with an environment that is rich in therapeutic sensory tools and routines to mitigate the symptoms of ASD. Atmospheres that provide these tools and routines are one sort of environmental enrichment therapy that can be implemented within virtual learning environments to address multiple areas of deficiency for individuals with ASD.

Responding to Sensory Processing Challenges

Similar to social communication deficits, maladaptive behaviors resulting from sensory processing deficits may also begin as frustration or anxiety and then manifest as more observable maladaptive behaviors. Dissatisfaction with self and/or learning and decreased motivation with learning and social engagement are also very realistic consequences of maladaptive behaviors. Such affect toward the self or the environment can lead to depression or other depressive or

anxiety disorders. Because of this, there is a need for behavioral modification interventions such as cognitive behavioral therapy and behavioral analytic approaches.

Cognitive Behavioral Therapy

Cognitive behavioral therapy is one solution to address this need for behavioral modification. Cognitive behavioral therapy is a commonly used form of psychosocial therapy that is used to treat anxiety among individuals with ASD (Lake et al., 2020). This form of therapy is used to target maladaptive thought processes among individuals with ASD. The theory surrounding this type of behavior modification asserts that there is a connection between an individual's thoughts, feelings, and behaviors (Sharma et al., 2021). As 95% of children with ASD also suffer from sensory processing deficits (Baker et al., 2008), any non-medicinal behavioral modification intervention that relies on strengthening an individual's thoughts may not be as effective as those interventions that deal directly with physical and observable behaviors.

Behavioral Analysis

While adapted cognitive behavioral therapy may effectively address behaviors through psychosocial modification, behavioral analytic approaches to behavior modification may be more appropriate among individuals with LFA (Rosen et al., 2016). Behavioral analytic approaches (including positive behavioral supports such as ABA) directly apply the concepts of conditioning and associative learning to identify and address behaviors. Further, according to Rosen et al. (2016), "research indicates that anxiety is associated with additional impairment for individuals with an autism spectrum diagnosis" (p. 121). Therefore, to be most effective, a behavioral intervention may also need to include desensitization and reinforcement components,

as in Skinner's process of operant conditioning and Thorndike's learning theory. Both can be applied in person or through virtual learning (Rosen et al., 2016).

Virtual Learning Systems

In 2020 students everywhere experienced an interruption in their studies due to a global pandemic that challenged the typical way of teaching in brick-and-mortar public schools (Stenhoff et al., 2020). The shift to virtual learning was almost instantaneous, and for students and educators alike, this presented a learning curve. Since then, new teaching strategies have been developed, and previously established strategies have been modified to meet the increasing technological demands of a newly expanded virtual learning education system (Hurwitz et al., 2022). Virtual learning presents new opportunities for students with all levels of abilities to progress and excel in reaching their educational and personal goals.

Virtual Learning

Virtual learning involves the use of technology to teach concepts to individuals. Historically, virtual learning has often been associated with web-based learning, as seen in online learning programs. With its growing popularity and advances, a more concise definition is needed. Sangrà et al. (2012) define virtual learning, or e-learning, as using electronic media to facilitate learning. It includes using technology and the Internet to support learning and teaching online (Valencia et al., 2019). Today, virtual learning includes game-based learning, computer-based learning programs such as Khan Academy, Immersive and Non-Immersive Virtual Reality (IVR and NIVR) systems, and much more (Freina et al., 2016). By integrating any combination of media, virtual learning can optimize educational technology to enhance "the learning process for people with intellectual disabilities or autism" (Tsikinas & Xinogalos, 2019, p. 61).

Virtual Learning Environments

It should be noted that virtual assistive technology is only one type of virtual technology that can be implemented within virtual learning environments, and multiple technologies should be used to create a more well-rounded and supportive educational environment. A virtual learning environment is an intentional result of combining several virtual technologies to provide an all-inclusive online learning experience (Oxford University Press, 2024). It is a multifaceted approach to learning conducted primarily within a virtual environment, but it also includes opportunities to practice and apply learned concepts within the natural or physical environment. As a system, virtual learning environments include virtual resources that allow educators to assess and track student learning and methods to support synchronous collaboration and communication among all participants (Phungsuk et al., 2017). In a virtual learning environment, most modifications and changes are made virtually, and many are based on input and experiences observed within the natural environment (i.e., maladaptive behaviors, lack of engagement, distracted focus, etc.).

Virtual Assistive Technology

In its simplest form, one major category of virtual learning for students with disabilities involves implementing virtual assistive technology. To understand what virtual assistive technology means, one must first understand its parent category. Assistive technology is a broad term to describe any device or tool used to support or assist people with disabilities in accomplishing a task (Pritchard et al., 2021). Assistive technology is also used to improve the functioning abilities of people with disabilities, and as such, it can also be viewed as an instrument for extended cognition. Assistive technology includes audio recording devices, specialized furniture, computer software, smart devices and applications, manipulatives, pencil grips, specialized writing implements, etc.

Virtual assistive technology is defined as assistive technology that occurs or exists primarily within an online or virtual reality environment (Merriam-Webster, n.d.). This definition includes assistive technologies specific to virtual learning environments, such as screen and digital line readers, speech-to-text and text-to-speech software, smart devices, and related applications. In addition to the academic benefits of using virtual assistive technology to assist with learning, students with LFA benefit from using virtual assistive technology as functional support or intervention. As a functional support, virtual assistive technology can support students in gaining access to or actively engaging in the learning environment (Fernández-Batanero et al., 2022; Pritchard et al., 2021). Virtual learning itself may also be considered a form of assistive technology, and as such, virtual learning systems that include virtual manipulatives can be implemented to improve, maintain, and increase the "functional capabilities of students with" ASD (Individuals with Disabilities Education Act, 2004, 20 U.S.C. § 1401).

Virtual Manipulatives

Along with assistive technology, virtual manipulatives are another element of virtual learning that can be used to assist students with and without disabilities. Pritchard et al. (2021) distinguish between technology that is used in an assistive manner and assistive technology. When the authors' definition is applied to the virtual learning environment, it can be assumed that virtual assistive technology is any tool explicitly used to assist people with disabilities. In the realm of education, virtual manipulatives are virtual technologies that are used in an assistive manner rather than functioning solely as assistive technology. Virtual manipulatives are computer-generated versions of tangible objects that can enhance the virtual learning experience for learners with and without disabilities (Shurr et al., 2021). For students without disabilities,

virtual manipulatives can be used to support and demonstrate an understanding of complex concepts. Virtual manipulatives and other virtual learning technologies used to assist students can also be implemented as organizational components of a virtual learning environment. Benefits such as enhanced organizational skills, improved understanding, and expanded creativity and independence in demonstrating understanding are just some benefits available to all learners who utilize virtual learning technologies. Virtual manipulatives are particularly appealing to visual learners.

As students who struggle with processing and understanding sensory information, virtual assistive technology and virtual manipulatives provide significant benefits to students with LFA. These virtual tools can be utilized by students who participate in virtual learning environments and those who participate in person within a physical classroom setting. As with their physical counterparts, virtual assistive technologies and virtual manipulatives can provide benefits across all subjects for students with disabilities. These benefits are sometimes more significant than concrete assistive technologies. For example, one study found that when compared to concrete manipulatives, the implementation of virtual manipulatives supported students with HFA in achieving higher levels of accuracy and independence when completing math problems (Shurr et al., 2021). When combined, the implementation of both concrete and virtual manipulatives can have significant positive effects on students with ASD.

Virtual learning technologies, whether they are in the form of virtual assistive technology, virtual manipulatives, or virtual learning environments, are effective in helping students with disabilities to acquire, maintain, and improve their skills in several developmental areas such as academic, social communication, adaptive, independent living, and others.

General Benefits of Virtual Learning

As 21st-century learners, it has become increasingly important for students to understand computers and utilize computer technology in real-world situations. As digital technologies become normalized and, in some cases, part of navigating the world, the need to adapt an individual's learning to include virtual components persists (Zhao & Watterston, 2021). Another benefit relevant to all students participating in a virtual learning environment is the enhanced levels of satisfaction, active engagement, and information recall experienced by the students (Ryan & Poole, 2019). By effectively implementing multiple virtual learning tools and creating opportunities for the student to have an active part in developing the learning experience, educators may be able to increase student satisfaction and mitigate the effects of decreased motivation and engagement that are sometimes experienced by learners (Chyung & Vachon, 2013; Hanesty et al., 2020). Educational institutions being able to implement these tools effectively may improve student success by motivating them to demonstrate the behaviors necessary to achieve their learning goals.

In addition to enhancing student motivation, when done effectively, virtual learning environments provide unique opportunities to support social interaction among students (Khlaisang & Songkram, 2019). Unlike the type of learning that is typically offered within the physical classroom setting alone, virtual learning environments provide learning that "represents a change from static learning to dynamic learning, from isolated learning to interactive learning, from private learning to public learning, from hidden learning to visible learning, and from exclusive learning to inclusive learning" (Khlaisang & Songkram, 2019, p. 42). Virtual learning environments also enhance learning by supporting learning activities within the virtual classroom and during independent learning outside of teaching sessions. This support has positive

implications for students without disabilities as well as for students with disabilities as it allows the student to more easily apply the skills learned to real-world situations and increases the generalizability of learned concepts (Laffey et al., 2009; Zhao & Watterston, 2021). This ability to generalize learning concepts is helpful for students with intellectual disabilities.

Benefits for Students with ASD

While virtual learning environments present benefits to students with and without disabilities, the benefits related to increased independence, level of functioning, and quality of life may be significantly more impactful for students with ASD. Virtual learning environments serve as vehicles for addressing the most pervasive areas of deficit among students with LFA (i.e., social communication, social interaction, and restrictive and repetitive behaviors). For example, Rosli et al. (2021) found that children with ASD had favorable and positive responses to a non-immersive virtual reality application and demonstrated improvements in their social skills. Educators reported that for the students with ASD in their distance learning programs. At the same time, specific goals were difficult to target initially. Others were easier to target. The students benefitted from fewer distractions, increased parent involvement, more opportunities for 1:1 instruction, and learned new skills (Tomaino et al., 2022).

Existing research on students with disabilities who participate in virtual learning environments indicates that while virtual learning is beneficial to individuals with intellectual disabilities in general, there may be different implications for individuals with HFA and LFA (Laffey et al., 2009). Specifically, benefits related to the method used to provide virtual learning instruction may be more impactful for students with LFA. Because virtual learning can either be applied as a means of synchronous learning or as a digital learning strategy, it presents new opportunities for supporting students with ASD and anxiety disorders, allowing for first-hand

experiences that were before very difficult, if not impossible (Alcañiz Raya et al., 2020; Laffey et al., 2009). There are positive implications for addressing issues surrounding atypical sensory processing and interpretation among students with LFA.

For example, students can use IVR to have a virtual learning experience within a virtual environment that involves all their senses" (Freina et al., 2016, p. 102). This type of environment allows for the incremental introduction of single or multiple stimuli to support students with hypersensitivity in acclimating to a multi-sensory environment (Freina et al., 2016; Sharma et al., 2021). Alcañiz Raya et al. (2020) discovered that when participating in a virtual learning environment (specifically virtual reality), students with ASD became desensitized to novel stimuli when they were repeatedly exposed to them over time. This desensitization through repeated exposure supports the notion that virtual learning benefits students with ASD by promoting habituation and addressing issues related to hypersensitivity, such as RRBs and challenging behavior (Schulz & Stevenson, 2019).

Benefits for Addressing Challenging Behavior

In addition to addressing sensory processing issues, virtual learning may also address challenging behaviors. Due to the higher level of control over stimuli, introducing virtual learning may be an optimal tool for operant conditioning. By systematically introducing stimuli and reinforcements and through repeated exposure, virtual learning can help individuals with LFA and hypersensitivity to sensory stimuli to develop the coping mechanisms necessary for successful functioning in social environments. Once a functional behavior analysis has been conducted and the function of the behavior identified, the higher level of control over environmental factors that virtual learning affords makes it a prime method of implementing behavior modification interventions. In this way, program developers and educators can address

some of the root causes of challenging behavior (hyper- and hypo-sensitivity) by developing or implementing a comfortable virtual learning experience for children with ASD and allowing for gradual exposure to various operants. This manipulation of environmental stimuli and responses is a crucial feature of the theory of associative learning and the laws of learning.

Applying the results of behavioral analyses can allow teachers to take a more strengths-based approach to address the pathology-related behavioral needs of the students. While this can be done both within an in-person or a virtual learning setting, virtual learning environments can be uniquely altered to provide a robust and individualized learning environment. By effectively individualizing EBPs to meet the specific needs of the student with LFA, virtual learning educators can create a rich learning experience by capitalizing on the uniqueness of the setting. One benefit of virtual learning is providing educators with the opportunity to implement EBP strategies that address the most pervasive impairments that affect student behavior, such as hypersensitivity and habituation to novel stimuli.

EBPs for Students with LFA in VLE

Another aspect of this issue is the application of technology-based EBP interventions for individuals with LFA. Teaching strategies derived from ABA principals comprise most of what is considered evidence-based practices (Ferguson et al., 2019). Studies suggest that a multimodal teaching approach that includes educating both the parent and student and teaching the parent how to implement teacher-provided instruction effectively is most effective in distance instruction (Stenhoff et al., 2020). Additionally, to effectively support students with the most pervasive disabilities, modifications are needed in relation to the method of implementation of the EBP rather than the EBP itself (C.J. Miller et al., 2021; Wiltsey Stirman et al., 2019). The same EBPs that support students with LFA in brick-and-mortar schools can be effective in

VLEs. Student success in VLEs somewhat depends on the educator's sense of competency and level of training (Liu et al., 2022).

By providing professional development training focused on addressing the pathological needs of students with LFA while supporting student autonomy, educators may be able to more effectively mitigate the behavior challenges that students with LFA sometimes demonstrate. Educator professional development programs that mirror some of the aspects of telehealth services may be beneficial to this goal as research overwhelmingly supports the use of telecommunication technologies to provide behavioral interventions designed to produce positive behavioral outcomes such as strengthening prosocial behaviors, decreasing hyperactive behaviors, and providing parent training for individuals with ASD (Marino et al., 2020; Pennefather et al., 2018). Empirical research is needed to explore the specific variables that address the behaviors that result from pathological impairments and foster positive behavioral outcomes (i.e., reduction of non-desired behaviors and increase of desired behaviors) for individuals with LFA and behavioral challenges within academic virtual learning environments to develop a more robust support system for students with LFA and educators (Neely et al., 2021).

High Functioning ASD and Virtual Learning

There is a plethora of research validating the effectiveness of virtual learning for individuals with mild intellectual disabilities such as ASD and learning disability (LD). Virtual learning has been shown to support improvements in the areas of social competency, motivation and concentration, social and emotional skill development, anxiety and sensory processing difficulties, non-verbal and verbal language development, and others (Lan et al., 2020; Stichter et al., 2014; Wang & Xing, 2022; Yuan & Ip, 2018; Zhang et al., 2020). One study, for example,

found that students with ASD and LD who utilized virtual manipulatives to support their acquisition of targeted math skills could successfully acquire and maintain the skills even without explicit instruction in subsequent trials (Bouck et al., 2020). Virtual manipulatives were also considered to be less stigmatizing and more age-appropriate for secondary school students with ASD and LD (Bouck et al., 2020). Due to their ability to engage in higher-level cognitive functioning processes and comprehend higher-level academic concepts, this population of students requires less intrusive intervention and support (American Psychiatric Association, 2022; Harvey et al., 2019; Hoogenhout & Malcolm-Smith, 2017). The intensity of accommodations or supports needed to help individuals with HFA progress in an academic environment is less than required to support individuals with LFA. Additionally, individuals with HFA can work more independently when interventions are implemented. Therefore, most of the studies that target students with ASD are studies that include students with HFA.

Underserved Students with LFA

Although interventions are available to help individuals with ASD in general succeed, there is a significant lack of research supporting the implementation of these interventions for individuals with LFA. The existence of a comorbid diagnosis of ASD along with intellectual disability is a hallmark of levels 2 and 3 ASD, and it is present among some individuals with level 1 ASD. According to Russell et al. (2019), approximately 50% of individuals with ASD also have an intellectual disability. Still, only about 6% of all studies involving ASD research include individuals with ASD and intellectual disabilities. This gap in studies is an issue that is evident across all subjects of ASD research, including virtual learning. In a meta-analysis by Grynszpan et al. (2014), 67.8% of the participants with ASD had above-average IQ scores, supporting the notion that individuals with HFA are overrepresented in research targeting

individuals with ASD. Conversely, this indicates that individuals with LFA are underrepresented in ASD research.

Further, Stedman et al. (2018) discovered that research involving individuals with LFA has significantly decreased over time. The authors specifically expressed the need for treatment studies involving individuals with LFA. While sufficient theories and interventions address the issues experienced by individuals with LFA in virtual learning environments, these theories and interventions have not been tested for the targeted population (LFA). Closing the gap in research becomes more urgent when the socioeconomic factors that affect this population of students are considered. Factors such as lack of access to technology, parent education level, and gender may further marginalize this population and add to their underrepresentation in the bulk of educational research.

Summary

In this literature review, the positive behavioral supports for students with ASD in virtual learning environments were explored. Students with LFA and their educators are largely ignored in the literature supporting EBPs for individuals with ASD. The need for supports and EBP that allows educators to address the most pervasive needs of students with LFA (i.e., maladaptive behaviors, sensory sensitivity, habituation, and social communication and interaction) is evident. The theoretical perspective of Thorndike's laws of learning regarding its appropriateness to this study was presented to address these areas of need. Studies show that virtual learning environments are beneficial to helping students with LFA to succeed in school. They also provide an opportunity for educators to develop a robust learning environment that capitalizes on the uniqueness of the situation. By exploring the implementation of positive behavioral supports and strategies and anxiety-reducing interventions (via modified EBPs) for individuals with ASD

in educational settings, there is a potential to significantly and positively impact the educational access and functioning of individuals with LFA who participate in online instruction. Ultimately, this literature review and subsequent study aimed to address the needs of students with LFA and behavioral challenges and the educators who support them by applying Thorndike's laws of learning to explore the root of pathologically derived problematic behaviors. This study also aimed to expand the body of knowledge directly involving individuals with LFA and provide a solution to support educators and help individuals with LFA to function successfully in virtual learning environments.

CHAPTER THREE: METHODS

Overview

The purpose of the study is to describe teachers' experiences regarding positive behavioral supports for students with Low Functioning Autism (LFA) and behavioral challenges who participate in virtual learning environments (VLE). A phenomenological research design is applied using a transcendental phenomenological approach to address this issue. Data collection methods include interviews, focus groups, video journals, and surveys. The research design, positionality, and methods for analyzing data are discussed. The specific data collection methods were selected for their ability to garner rich descriptions, insight, and details regarding the phenomenon. A description of how this increases the study's trustworthiness and ethical considerations is also included.

Research Design

A qualitative research design allows the researcher to study phenomena in their natural settings and deduce meaning from them in relation to the human experience (Denzin & Lincoln, 2011). This design is appropriate for investigating many issues related to people with disabilities because it offers unique methods of gathering meaningful information most representative of the intricacies of issues or phenomena that this group experiences. Since the field of special education is multifaceted and full of nuances (such as type of disability and level of support), the research design must be one that will enable me to have a more direct role in exploring the actual lived experiences of the participants (Leko et al., 2021).

Additionally, when conducting a study involving the lived experiences of individuals highly dependent upon interaction with others to function and communicate, the researcher must be able to step in as an integral part of the study (Leko et al., 2021). By examining the

phenomenon subjectively and from multiple teacher accounts, I could consider the individual experiences of the human condition that are often negated by the objective nature of a quantitative research design. According to Kozleski (2017), qualitative research has the unique advantage of contributing to EBP by serving as a tool by which the most significant problems related to practice and intervention can be studied. As it relates to this study, a qualitative research design has allowed me to effectively study the phenomenon of positive behavioral supports for students with LFA and behavioral challenges who participate in virtual learning environments and address the equitability of EBP and supports for this specific population of students.

The qualitative research design most appropriate for this research is phenomenological. Qualitative research allows me to answer the "what" of an inquiry. In contrast, a phenomenological research design presents a structured approach by which I can argue the merited truths of the phenomenon (Van Manen, 1990). A phenomenological approach appropriately begins with a description of the phenomenon and then reveals the underlying structures of the phenomenon as it relates to the human experience (Moustakas, 1994). Regarding this study, a phenomenological research design has allowed me to explore the conscious experiences of Special Education Teachers so that the underlying structures of positive behavioral supports for LFA students within virtual learning programs are revealed (Jackson et al., 2018). Because of cognitive functioning and communication issues, ascertaining the experiences of individuals with LFA is often challenging. It was beneficial for me to employ a phenomenological research design that uses a multimodal approach to investigate phenomena affecting the lives of these individuals and then to come to a well-informed and representative conclusion about the essential elements of the phenomenon.

A critical factor in determining the appropriateness of the phenomenological research design for this study was that it relies on rich descriptive data to understand the underpinnings of the phenomena. The phenomenological research design presents a unique opportunity to capitalize on various descriptive data collection techniques to "overcome the potential distortion of human perception, or misleading naturalistic assumptions of the world to reveal the essences of intentional consciousness" (Stolz, 2020, p. 1079). In other words, a phenomenological approach has allowed me to uncover the most authentic perceptions regarding how individuals with LFA benefit from and function in virtual learning environments. Moustakas (1994) calls this the essence of the phenomenon, whereas Van Manen (1990) describes this as the "inner essential nature of a thing" (p. 177). This discovery was the goal of the proposed study, adding to the appropriateness of the phenomenological research design.

Lastly, according to Stolz (2020), the objective nature of a phenomenon is best understood after it is first considered through a subjective lens. Mainly, employing subjective data collection methods such as interviews, focus groups, and written accounts was most effective in researching the essential elements of positive behavioral interventions within virtual learning programs for individuals with LFA. Using a phenomenological approach in the initial investigation of this topic provided information that may form the basis for future quantitative studies regarding specific interventions that could mediate any perceived inequities in virtual learning for individuals with LFA. The study's qualitative nature can lead to more objective and experimental future research, allowing specific programs and interventions to be tested for effectiveness (Bloomfield & Fisher, 2019).

Transcendental phenomenology was the most appropriate type of phenomenological design for this research. Transcendental phenomenology, first proposed by Edmond Husserl in

1901, is also known as Husserlian phenomenology (Crișan & Copoeru, 2020). Husserl (1970) explained that:

> [Transcendental phenomenology] has, as its exclusive concern, experiences intuitively seizable and analysable in the pure generality of their essence, not experiences empirically perceived and treated as real facts, as experiences of human or animal experience in the phenomenal world that we posit as an empirical fact. (p.166)

Additionally, Moustakas (1994) refers to these general meanings as the essences of the phenomenon.

Today, transcendental phenomenology is the idea that phenomena can be observed in the purest sense by relying on intuition and sensual perceptiveness to gain subjective understanding (Moustakas, 1994). Then, after real experiences are analyzed, using bracketing (epoché), the researcher can perceive the phenomena in a way that is without biases, presumptions, or popular opinions (Moustakas, 1994). Next, a complete and unaltered description of the phenomenon is produced from this fresh and pure perspective through transcendental-phenomenological reduction. Whereas transcendental-phenomenological reduction is concerned with creating a textural description of the phenomenon, imaginative variation is concerned with producing a structural description of essences of the phenomenon (Moustakas, 1994). When added to the objective nature of the thing, this knowledge can lead to absolute knowledge regarding the phenomenon (Moustakas, 1994). There are many aspects of experience to be perceived when considering virtual learning, challenging student behaviors and supports, individuals with LFA, and implemented teaching strategies and EBP. The ability of the transcendental-phenomenological research design to allows the researcher to consider the experiences of teachers of individuals with LFA in an intuitive, multisensory, and part reductionist way while

refraining from tainting the description of the experience through the personal interpretation or preconceived notions, makes it the most ideal research design for this study.

Research Questions

There is a demand for new inclusive educational supports for all types of virtual learners. This need for inclusive educational supports is especially true for marginalized students with LFA and behavioral challenges. Studies exploring how this population of learners can be supported via virtual learning agents validate the notion that benefits may be gained for this population. This study aimed to investigate the lived experiences of students with LFA participating in virtual learning environments. Insights were gained through exploring teacher experiences regarding support to address the root causes of maladaptive behaviors among students with LFA.

Central Research Question

What are the shared experiences of Special Education Teachers who implement positive behavioral supports (PBS) for students with LFA and behavioral challenges who participate in an academic virtual learning environment?

Sub Question One

How do teachers experience the essential components of readiness among students with LFA in an academic virtual learning environment?

Sub Question Two

How do teachers experience the essential components of exercise among students with LFA in an academic virtual learning environment?

Sub Question Three

How do teachers experience the essential components of effect among students with LFA in an academic virtual learning environment?

Setting and Participants

Two of the most critical aspects of human research are the setting where the phenomenon is expected to be observed and the population among whom the phenomenon is thought to have a direct or significant effect. A description of the participants and setting of the study is vital to its replication. It also has implications for determining the transferability of the study's results. This section describes the essential information related to the participants and the setting of the study.

Setting

Since potential recruits represent a niche group of educators who provide services to a marginalized and often stigmatized group of students, participants were initially obtained through purposive sampling (Blackstone, 2014). Snowball sampling was also used to secure additional qualifying participants. All participants are special education teachers (also known as education specialists) who currently teach online at a virtual K-12 school in the United States. No specific school site was used in this study. While all participants taught students in the virtual setting, at least two participants also met with students in person once a week.

At least eight out of 10 participants worked at a virtual public school in California, Nevada, Arizona, or Illinois. Participants taught under the leadership of a School Principal and Special Education Administrators. At least six out of 10 participants also served under a Program Specialist. Each one of the participants provides specialized academic instruction to students with LFA in grades six through nine (typically junior high school) and/or nine through 12 (typically high school).

Participants

Participants in this study were Special Education Teachers who teach students with LFA and challenging behavior in a VLE. All participants have earned a bachelor's degree or higher, hold a special education teaching credential, teach students with LFA in grades six through 12, and have at least three years teaching students with disabilities. This study included 10 participants. Participants varied in their geographic locations, ages (range 25-50), school settings, gender (nine females and one male), ethnicity, and employment status (full-time, part-time, and substitute).

One participant taught students part-time, and all other participants were full-time K-12 teachers. Most participants taught students from multiple grades, from sixth through ninth grade. One participant also taught students in a transition program. All participants also previously taught students in brick-and-mortar settings before teaching online as special education teachers.

Researcher's Positionality

My motivation for conducting this study stems from an awareness of the interactions of power and social norms and the multiplicity of ways in which these norms affect the lives of individuals with ASD. As an educator who has worked with students with ASD as a teacher, paraeducator, and behavioral therapist, I have had the unique opportunity to observe the often misinterpreted strengths and challenges of these students and the effects of turning off noetic frameworks and social ideals. I intended to pursue participatory action research to gain perspective on the inner structures from which challenging behaviors stem among these students within the educational environment.

Interpretive Framework

The lens through which I have conducted this study is the transformative interpretive framework. A transformative framework is applied when the researcher intends to use the knowledge gained through the research to challenge the power and social relationships within a society to aid people in improving society (Creswell & Poth, 2018). My reason for selecting the transformative framework is because it can be aptly applied to research that addresses issues related to participants who are members of marginalized groups. It is the most appropriate lens for considering the supports that profoundly affect the lives of marginalized students with LFA who demonstrate behavioral challenges. By considering the research topic through the transformative lens, I aimed to shed light on the experiences of individuals with low-functioning ASD in high school virtual learning programs.

Moreover, I aimed to address issues related to the inequities in educational supports often experienced by this group of individuals so that they are empowered to reach greater heights of achievement within the school system (Mertens, 2007). Employing the transformative interpretive framework in this study, I intended this study to facilitate transformation first on an individual level through the lives of the Special Education Teachers that facilitate learning for students with LFA (Mertens, 2017). In addition, I intended for this transformation to move beyond the individual educator to the individual student and then to the community or society. A discussion of my interpretive framework and philosophical assumptions is provided.

Philosophical Assumptions

Several philosophical assumptions must be declared as I considered the design, procedures, and interpretation of information related to this study. My Christian faith, past experiences, and social conventions have shaped my philosophical assumptions. These have

collectively formed my currently held values and biases, which must be bracketed to ascertain the truth about the phenomenon I have studied. In line with this goal, a discussion of my positions on reality (ontological assumption), my relationship to the phenomenon (epistemological assumption), and my currently held values and biases (axiological assumption) is provided (Creswell & Poth, 2018).

Ontological Assumption

The ontological assumption to which this research adheres, and to which I subscribe, is that multiple perspectives account for one singular truth. I believe God's truth presents one singular reality and that various perspectives of experiences or situations relating to the world and the unaltered truth play into that reality (D. Carr, 1977; Moustakas, 1994). I believe multiple perspectives should be taken into account because they provide valuable bits of information, shedding light on the totality of the experience (phenomenological reduction). However, to fully analyze and understand this phenomenon, I considered the separate aspects of that singular reality as it relates to supports for students with LFA and behavioral challenges in VLE, which include the noema (perception of the phenomenon) and noesis (previous experiences related to the phenomenon) (Given, 2008; Moustakas, 1994). I believe that only after this can the truth of the phenomenon be discovered (epoch).

Epistemological Assumption

The epistemological assumption I present is that the participants' lived experiences represent knowledge of the phenomenon. Rather than leaning solely on the appearance of how student behaviors present themselves and what teaching strategies are available to support learners, I have strongly considered the evidence of the actual participant experiences. By considering participant statements regarding the phenomenon, I have considered how this

knowledge (participant experiences) impacted how the behaviors are perceived and the supports provided to address learning issues. By considering the knowledge of many, I have gained a more holistic understanding of the phenomenon (Creswell & Poth, 2018; Moustakas, 1994).

Axiological Assumption

As a Special Education Teacher who has taught students with LFA, I have experienced, in some capacity, how students with LFA function in virtual learning environments. Because of my role as a special education teacher and researcher, I have specific knowledge regarding the support that can be used to support students with LFA in VLEs. Additionally, as a close relative of someone with LFA, I am privy to parental perspectives regarding the support for individuals with LFA that is available but not consistently implemented and the frequently implemented support. I have witnessed that individuals with LFA and behavioral challenges who participate in virtual learning environments have unique challenges that necessitate additional supports and individualized routines for them to succeed. The idea that students are most successful when the educators supporting them are sufficiently trained and when the students are consistently provided with individualized supports and routines are two values that I have that may have shaped the narrative related to this study. In proceeding with the study, my awareness of my personal experiences and positionalities was necessary to minimize the influence of biases. Implementing a set protocol of activities before data collection and throughout the study (including epoch and reflection) mitigated the confounding effects of personal noetic frameworks and values that may introduce biases (Moustakas, 1994; Roberts, 2018, 2019).

Researcher's Role

In this study, I was to be a provider and collector of surveys and video prompts, an interviewer, and a focus group facilitator. I also recorded and analyzed data throughout the study.

I conducted this study as a human instrument by which qualitative data related to the problem can be collected. In line with the requirements of the transcendental-phenomenological process, I engaged in the epoché process throughout the study to refrain from submitting my interpretations about the study problem (Moustakas, 1994). I also served as an outsider to the virtual learning environment. As an outsider of the virtual learning environments within which the participants have experienced the phenomenon, I segregated my judgments related to the study through reflective journaling.

Procedures

The study began by securing the necessary approval from the IRB. Once permission had been granted, participants were recruited, and a screening survey (Appendix H) was provided. Next, a recruitment package, including a demographic survey (Appendix C) and an informed consent form (Appendix B), was provided to participants who met the eligibility criteria. Participants received the demographic survey link and consent form via email. Once consent forms had been returned and surveys had been reviewed, the first data collection method, individual semi-structured interviews, was scheduled and conducted with each qualifying participant. Interviews were approximately 40 minutes and occurred via an online video conferencing platform when the participants were not teaching (Kallio et al., 2016). Immediately following each semi-structured interview, participants were asked to record a short video in which they verbally answered one video journal prompt (see prompt in Appendix G). For the third data collection method, a focus group was scheduled and conducted with all participants via the same video conferencing platform (see Focus Group Questions in Appendix F). This focus group was scheduled after video journal prompts were completed. Data triangulation was achieved by collecting data from interviews, video journals, and focus groups. Participants were

also provided with an opportunity to confirm or reject the researcher's interpretation of the data (McGaha & D'Urso, 2019).

Permissions

Before conducting the study, IRB approval was obtained (see Appendix A). In addition to IRB approval, all interview questions were reviewed by a team of professionals in the field (i.e., dissertation committee members). During the recruitment process, informational flyers were provided. They included a description of the purpose of the study, a summary of the protocol, eligibility criteria, and how to contact the researcher for additional information. Informed consent forms were provided via email to eligible recruits before participating in the study. A specific school site was not used in this study. Therefore, no site permission was required.

Recruitment Plan

Purposive criterion sampling was used to recruit participants for the study, followed by snowball sampling. Purposive criterion sampling was appropriate because it allowed the participants to be homogeneous. To qualify for the study, they had to meet specific criteria (i.e., teaching students online) (Creswell & Poth, 2018). Although a maximum sample size of 10 participants is what both Bartholomew et al. (2021) and Dukes (1984) recommend or associate with high-quality transcendental studies (with sample sizes of 3-10 being the recommendation), Liberty University School of Education guidelines require a minimum of 10 participants. A sample size of 10-15 participants is appropriate because it increases the depth of understanding regarding the participants' lived experiences concerning the phenomenon (Campbell et al., 2020).

Participants were recruited via social media posts, word of mouth (using snowball sampling), crowd-sourcing within various higher education communities, and personal connections. A demographic survey and informed consent form were included in the recruitment

package and provided to the participants via email at the beginning of the study. The sample pool for participants consists of an unidentified number of Special Education Teachers who participate in VLEs and meet the eligibility criteria. The sample pool had homogeneity in potential participants and included individuals who shared similar lived experiences of the phenomenon being studied (Alase, 2017; Creswell & Poth, 2018). The sample size included 10 Special Education Teachers with at least one LFA student in their class (Bartholomew et al., 2021).

Data Collection Plan

No data was collected until IRB approval (Appendix A) was obtained. Once it was received, the study commenced with the completion of all participants' emailed informed consent forms (Appendix B) and demographic survey (Appendix C). Participant teachers were given pseudonyms to protect their privacy (Eldh et al., 2020). A preliminary guide of interview questions was pilot-tested by a specialist outside of the study (Kallio et al., 2016). After considering feedback and making the necessary changes, a final guide of interview questions was presented to individual participants for data collection. Semi-structured interviews were conducted after each participant had completed and returned the demographic survey. Semi-structured interviews were used to test the tenets of the associative learning theory (specifically Thorndike's Laws) and record teacher perspectives regarding the essential components of readiness, exercise, and effect for their students with LFA and behavioral challenges (Manzano, 2016; Thorndike, 1913). Interview data were analyzed to identify structural qualities and themes (Moustakas, 1994).

Next, video journaling was used as a supplement to participant semi-structured interviews. Finally, a focus group was conducted after the participants' video journals. The focus

group was used to facilitate participant interaction, spark dialogue, and provide encouragement that may yield additional data regarding participant experiences of the phenomenon being studied (Bradbury-Jones et al., 2009). This sequence of semi-structured interviews, video journaling, and focus group provided a method of member checking, supported the goal of reaching data saturation, and created the least disruption to the education process (Lincoln & Guba, 1985; Sutton & Austin, 2015). A description of each data collection method and analysis is provided.

Individual Interviews

One-on-one semi-structured interviews with Special Education Teachers were conducted and served as the primary data collection method for this transcendental-phenomenological study (Moustakas, 1994). One-on-one interviews are communications between the interviewer and the participants in which participants are asked to describe an experience (Tomaszewski et al., 2020). This data collection method was selected as the most appropriate method because it allowed the interviewee to express aspects of their lived experiences related to the phenomenon (Tomaszewski et al., 2020). It also allowed the interviewer to understand what was observed during the observation (Lincoln & Guba, 1985). Additionally, it allowed the researcher to gather rich descriptive data that can be used in categorical and descriptive analyses (Creswell & Poth, 2018).

To conduct each interview, the participant joined the interviewer in a live Zoom or Teams meeting in which the participant was asked a series of interview questions (Appendix D). Video interviews were appropriate for this study because, unlike interpretive phenomenological studies, descriptive phenomenological studies do not rely heavily on contextual information from the participant (de Villiers et al., 2021). Participants engaged in one interview for approximately

40 minutes. Participant responses were video recorded via the Zoom or Teams platform and transcribed by the related transcription services. Participant interviews occurred at an agreed-upon time according to the researcher and participant schedules. Each participant's interview was scheduled after verified eligibility and informed consent provided.

Individual Interview Questions

1. Please describe your educational background and career through your current position. CRQ and SQ3
2. According to the Laws of Learning by Edward Thorndike (1913), there are several observable elements that indicate or support student readiness in the class environment. Some of these elements include having lesson/task learning objectives that are clearly articulated, students demonstrating an interest in completing lessons/tasks, task/lesson purpose is clearly articulated (i.e., reward or benefit), making an effort to reduce outside worries or hindrances (i.e., calming strategies), and making an effort to physically or mentally prepare students for task/lesson. When working with students with LFA in your online class what components of readiness do you observe? How often is the component observed (less than, about, or greater than five days per week)? SQ1
3. What symptoms of anxiety are most frequently demonstrated among the students with LFA in your online classes? SQ1
4. Describe the behavioral and learning challenges that are experienced when working with students experiencing anxiety LFA in your online classes. SQ1
5. Describe the practices you use when working with students with LFA who experience anxiety in your online classes. SQ1

6. What signs of physical or mental unpreparedness are most frequently exhibited among the students with LFA in your online classes? SQ1
7. Describe the behavioral and learning challenges that are experienced when working with students with LFA who demonstrate signs of physical or mental unpreparedness in your online classes. SQ1
8. Describe the practices you use when working with students with LFA who demonstrate signs of mental or physical unpreparedness in your online classes. SQ1
9. According to the Laws of Learning by Edward Thorndike (1913), there are several observable elements that indicate or support student exercise in the class environment. Some of these elements include learning that is strengthened by repeated practice or exposure to positive stimulus-response pairings, recall, review, restatement, drills, and practical application. When working with students with LFA in your online class what components of exercise do you observe? How often is the component observed (less than, about, or greater than five days per week).? SQ2
10. What characteristics of hyposensitivity are most frequently demonstrated among the students with LFA in your online classes? SQ2
11. Describe the behavioral and learning challenges that are experienced when working with students with hyposensitivity and LFA in your online classes. SQ2
12. Describe the practices you use when working with students with hyposensitivity and LFA in your online classes. SQ2
13. What characteristics of hypersensitivity are most frequently demonstrated among the students with LFA in your online classes? SQ2

14. Describe the behavioral and learning challenges that are experienced when working with students with hypersensitivity and LFA in your online classes. SQ2
15. Describe the practices you use when working with students with hypersensitivity and LFA in your online classes. SQ2
16. According to the Laws of Learning by Edward Thorndike (1913), there are several observable elements that indicate or support student effect in the class environment. Some of these elements include reinforcing appropriate student behavior by providing pleasant consequences, reinforcing unpleasant student behavior by removing unpleasant consequences, student learning is strengthened by providing a satisfying experience, and student learning is strengthened by providing a reward. When working with students with LFA in your online class what components of effect do you observe? How often is the component observed (less than, about, or greater than five days per week)? SQ3
17. What learning challenges related to LFA do you observe when working with students with LFA in your online classes? CRQ, SQ1, SQ2, and SQ3
18. What types of RRBs do you observe when working with students with LFA in your online class? CRQ, SQ1, SQ2, and SQ3
19. What maladaptive behaviors do you observe when working with students with LFA in your online classes? CRQ, SQ1, SQ2, and SQ3
20. How are EBPs for learning and behavior modification (such as ABA) implemented for students with LFA within your online class? CRQ and SQ3
    a. How are appropriate behavior and learning reinforced or rewarded among students with LFA in your online class? CRQ and SQ3

21. Describe the most successful EBP or ABA strategies you use when working with students with LFA in your online classes. CRQ and SQ3
    a. What are some of the responses that students with LFA present when these strategies are implemented? CRQ and SQ3
22. What else would you like to add to our discussion regarding your experiences with students with LFA that we haven't discussed? CRQ, SQ1, SQ2, and SQ3

The first interview question is a rapport-building "grand tour" question (Marshall & Rossman, 2014, p. 73). This "grand tour" question also grounds the participant and helps them focus on experiences related to the interview topic (Marshall & Rossman, 2014, p. 73; Moustakas, 1994). The first question was also used to glean or substantiate demographic information from the participants. The remaining interview questions are related to the central research question and framed around teacher experiences regarding LFA student readiness, exercise, and effect related to positive behavior supports and Thorndike's Law of Learning (Thorndike, 1913).

Thorndike's theory of learning (associative learning theory) is the theoretical lens through which the interview questions have been developed. Questions two through eight are designed to gain in-depth information about Thorndike's (1913) law of readiness. Questions nine through 15 are designed to gain information pertaining to Thorndike's (1913) law of exercise. Question 16 is intended to gain information about Thorndike's (1913) law of effect. Questions 17-19 and 22 are associated with Thorndike's (1913) laws of learning in general regarding learning, behaviors, and positive behavior supports. Questions 20 and 21 are related to positive behavioral supports and Thorndike's law (1913) of effect.

Individual Interview Data Analysis Plan

Before the interview and throughout, I engaged in epoché to ensure that the phenomenon and experiences of the participants were perceived without presumptions of insertions of biases (Moustakas, 1994). Engaging in epoché was accomplished through regular journaling throughout the study and reflective meditation (Moustakas, 1994). Following this process of epoché, bracketing through reflective journaling allowed me to further refrain from prejudgments and give proper focus to the phenomenon and related experiences of the participants. This compartmentalization of non-related information ensured that the phenomenological reduction and data analysis process was "rooted solely on the topic and question" (Moustakas, 1994, p. 97).

After transcribing the interviews, I employed phenomenological reduction to continue this data analysis phase. Interview transcripts were combed for significant statements, quotes, or sentences that provided clues about teachers' experiences regarding positive behavioral supports, specifically involving students with LFA in the virtual learning environment (Creswell & Poth, 2018). This process of identifying experiences relevant to this phenomenon (horizontalization) was followed by a development of horizons or clusters of meaning derived from combining similar statements into themes (Creswell & Poth, 2018; Moustakas, 1994). These clusters of meaning were specific to teacher experiences of positive behavioral supports, and they "highlight(ed) the participants' experiences" with the student within the virtual learning environment (Tomaszewski et al., 2020, p. 5).

Once the data was separated into "meaning units" and then categorized into broader themes, I created textural descriptions of what the perceptions of the individual teachers experienced regarding positive behavioral supports for students with LFA within the virtual learning environment (Creswell & Poth, 2018; Moustakas, 1994). Verbatim examples from each

interview were included (Moustakas, 1994). The identified themes were also used to develop structural descriptions of how individual teachers experienced the phenomenon, and they contained elements of context and setting (Creswell & Poth, 2018; Moustakas, 1994). Moustakas' (1994) process of imaginative variation (considering the possible meanings and qualities of the experience) and individual textural descriptions of the phenomenon were used to develop individual structural descriptions. Next, composite structural and textural descriptions were created using the descriptive phenomenological approach described by Giorgi and Aanstoos (1985). Giorgi and Aanstoos's approach relies on inductive reasoning to transform descriptive units of information into thematic components whereby the essence of the phenomenon can be established (Tomaszewski et al., 2020). This inductive approach to describe the phenomenon was applied by analyzing each data collection method.

Video Journal

Immediately following each individual semi-structured interview, participants were directed to a separate Zoom link and asked to answer and record a series of journal prompts individually. This data collection method consisted of one journal prompt (open-ended question) related to the central research question and sub-questions (Creswell & Poth, 2018). The specific prompt was developed based on its ability to garner data related to participant perspectives on future trainings, perceived participant preparedness, and effectiveness of currently implemented EBPs for the specific student population. Video journal prompts took approximately 15 minutes to answer. Video transcriptions were obtained using the Zoom or Teams video transcription service. The video journal prompt is located in Appendix G.

Video Journal Data Analysis Plan

Data from video journals were analyzed according to the transcendental-phenomenological design. Each data collection method within this study was preceded by epoché and continual bracketing of unrelated information through reflective journaling (Moustakas, 1994). Based on the recorded data, the researcher engaged in horizontalization and deduced clusters of meaning (horizons) from participant statements and expressions (Creswell & Poth, 2018; Moustakas, 1994). These clusters of meaning were further developed into themes and then textural and structural descriptions of individual recordings. This process of epoché, bracketing, phenomenological reduction, horizontalization, and developing textural and structural descriptions (imaginative variation) from thematic clusters of meaning by way of inductive reasoning was repeated with data gathered from each data collection method used in the study. Data from the video journals was used to inform future implications.

Focus Group

The focus group was held for all participant teachers. This data collection method provided the researcher with another avenue for gaining in-depth information related to teachers' experiences regarding the study topic, allowed participants to interact and glean from others who have experienced the same phenomenon and served as a means to triangulate the data. The focus groups were used to corroborate information regarding teachers' perspectives gleaned from individual interviews (Lambert & Loiselle, 2008). One focus group of five participants was scheduled (Krueger & Casey, 2000). Focus group participants included a random arrangement of participants who responded to the focus group schedule. The focus group mimicked the individual interview questions in the setting (Zoom video platform), question development (based on the central research question and sub-questions), and timing (40 minutes maximum).

Focus Group Questions

The focus group questions are related to the central research question in that they are informed by elements directly related to the topic (Lambert & Loiselle, 2008). Questions were formulated to expound on data from the individual interviews and allow for data triangulation. Focus group questions fall into four categories: introductory/engagement, exploration, follow-up, and exit (Appendix F) (Then et al., 2014). As with the individual semi-structured interviews, epoché preceded the focus groups, and bracketing through reflective journaling was practiced throughout the study.

1. Thank you for participating in this focus group. Describe successful practices you've used to support students with LFA and behavior challenges in a VLE. CRQ, SQ1, SQ2, SQ3
2. Describe your challenges when working with students with LFA and challenging behaviors in a VLE. CRQ
3. How often do you attend school-initiated professional development trainings related to supporting students with LFA? CRQ
    a. Have these trainings been related to supporting students with LFA in a VLE? If so, how many? (follow-up) CRQ
4. What experiences or trainings have you had that have prepared you to support students with social communication challenges? CRQ
    a. What experiences or trainings have you had that have prepared you to support students with social communication challenges in a VLE? (follow-up) CRQ
5. What experiences or trainings have you had that have prepared you to support students with increased or abnormal sensory interests? CRQ

    a. What experiences or trainings have you had that have prepared you to support students with increased or abnormal sensory interests in a VLE? (follow-up) CRQ

6. What experiences or trainings have you had that have prepared you to support students with hyper- or hypo-sensitivity? CRQ
    a. What experiences or trainings have you had that have prepared you to support students with hyper- or hypo-sensitivity in a LE? (follow-up) CRQ
7. Challenging behaviors that are demonstrated by students with LFA are often related to communication challenges, anxiety avoidance, sensory-seeking, and access to tangibles. What experiences or trainings have you had that have prepared you to address these functions of challenging behavior? CRQ
    a. What experiences or trainings have you had that have prepared you to address these functions of challenging behavior in a VLE? (follow-up) CRQ
8. Would you like to share anything else about your experiences in supporting students with LFA and challenging behavior in VLEs? CRQ

Focus Group Data Analysis Plan

The plan for the analysis of focus group data is similar to the analysis of the interview data. Moustakas' (1994) transcendental-phenomenological process for data analysis and synthesis was followed. The Zoom focus group meeting was recorded and then transcribed through Zoom transcription. Once the data was transcribed, phenomenological reduction took place using horizontalization to group significant statements into meaningful clusters (Moustakas, 1994). These clusters of meaning, or invariant qualities of experience, were further analyzed, and the data was refined into themes that allowed the researcher to develop textural descriptions (Creswell & Poth, 2018; Moustakas, 1994). The researcher also developed structural

descriptions of focus group data combined with imaginative variation to make sense of contextual information and gaps (Moustakas, 1994).

Data Synthesis

Data synthesis began with the development of composite textural and structural descriptions of the phenomenon based on the data gathered from each data collection method. Information was coded and organized thematically. This process was done manually and via data collection software. Ultimately, answers to the central research question and sub-questions were determined based on the "essence" of the codified responses (Creswell & Poth, 2018: Moustakas, 1994). However, Moustakas' (1994) data analysis process for transcendental-phenomenological studies was followed closely with some consideration for Giorgi and Aanstoos' (1985) phenomenological analysis method.

Each data collection method first synthesized composite textural descriptions of the phenomenon individually. Then, the textural and structural descriptions of the phenomenon were analyzed collectively across all data collection methods. Moustakas (1994) describes this process as a movement from broad to narrow descriptions and then back the other way to gain a wider understanding of the phenomenon. In line with this process, the collective composite textural descriptions (combined analysis of all individual textural descriptions) and collective composite structural descriptions (combined analysis of all structural descriptions) were synthesized to provide an essential invariant structure, or essence, of the perceptions of teachers regarding positive behavioral supports for students with LFA and behavioral challenges. (Creswell & Poth, 2018; Moustakas, 1994). Within this data analysis process, there is an iterative thread that allows information to flow between data collection methods, thereby supporting the triangulation of data within the study.

Trustworthiness

To establish rigor or trustworthiness in qualitative research, a study must show that it is credible, transferrable, dependable, and confirmable (Amankwaa, 2016; Lincoln & Guba, 1985). Establishing rigor in the research also supports the authenticity of the study results. In quantitative research, similar terms might be used to support the reliability and validity of the study. However, the methods that might demonstrate trustworthiness in a qualitative study are unique to qualitative research. A description of such methods as it pertains to this study is provided.

Credibility

Credibility is a trustworthiness criterion that is primarily established through the participants' eyes (Lincoln & Guba, 1985). For this study, credibility was established through triangulation, member checking, and peer debriefing. Specifically, qualitative data collection methods and theories were used to explore teachers' perspectives on practical support and EBP for students with LFA and challenging behavior who attend school online. Data collection methods were triangulated using interviews, a focus group, and video journals.

In addition to triangulation, member checking was also used to establish credibility within the study by allowing participants to confirm or reject the researcher’s transcriptions of participant data and descriptions of the phenomenon after the focus group phase (Lincoln & Guba, 1985; McGaha & D'Urso, 2019). Descriptions were developed by providing interview questions and developing themes and textural and structural descriptions of the phenomenon (Lincoln & Guba, 1985). Finally, peer debriefing was used to establish credibility and support the fidelity and impartiality of my data collection methods, analyses of data, and results. To

achieve this, I elicited feedback from my peers who have earned doctoral degrees and are familiar with my work.

Transferability

Transferability is achieved when the researcher demonstrates that the study's results are generalizable to other settings (Lincoln & Guba, 1985). Because of the richness and depth of descriptive information gleaned through the interviews, video journals, and focus group, I could identify the components of the phenomenon (setting, supports, teacher trainings, and behaviors) that influenced the outcome of the study. For example, many positive behavioral support interventions mentioned in the virtual learning environment have been previously established in other non-virtual environments. I demonstrated fittingness, or degree of unity, by exposing elements experienced in both VLEs and non-virtual environments in multiple contexts. The history of positive behavioral supports in other settings and among various age groups supports the transferability of the results to different settings. However, while the conditions may be present to support transferability, the level of transferability is ultimately determined by the reader and the reader's purpose for the study.

Dependability

Dependability is evidenced when the findings demonstrate repeatability and consistency (Lincoln & Guba, 1985). The dependability of the study results was achieved by submitting the research questions to the dissertation committee to be audited for reliability. Dependability is also reflected in the thorough and detailed explanation of the methodology provided in the procedure section of this study. Procedures are explained in sufficient detail to enable other researchers to replicate the study in the future. Additionally, an inquiry audit was conducted by my dissertation committee and the Qualitative Research Director at Liberty University.

Confirmability

Confirmability of the study results is achieved when the findings demonstrate a degree of objectivity or neutrality (Lincoln & Guba, 1985). To support confirmability, I followed the Husserlian phenomenological practice of epoché to withhold judgment during the data collection process and reduce researcher bias (Moustakas, 1994). Epoché was practiced before data collection and throughout the study. The method of epoché is first demonstrated by revealing my potential biases, as seen in my ontological, epistemological, and axiological assumptions and the researcher positionality section. I conducted interviews from an epoché perspective in which judgment and presumptions regarding the phenomenon were initially suspended.

A combination of the subjective experiences of individual Special Education Teachers (as revealed in interviews and video journals) and the sharing of these unique perspectives with other teachers (as demonstrated in the focus groups) created a more holistic and objective view of the reality of the phenomenon being studied (Moustakas, 1994). Additionally, I engaged in reflective journaling before each data collection and throughout the study to further support data collection and analysis objectivity through bracketing. Second, the data triangulation, as described above, further endorsed the confirmability of the study results (Lincoln & Guba, 1985). Finally, a detailed audit trail is provided describing the procedures, raw and analyzed data, and final report. Several documents have been included as appendices to support an audit trail.

Ethical Considerations

Several ethical considerations are discussed within this study. During the recruitment process, informed consent was obtained from all participants before participating in the study. Participants were thoroughly informed regarding what the study entails, the study timeframe, the

purpose of the study, and data collection methods. Participants were notified that their participation in the study was strictly voluntary and that they could resign from the study at any point. Participants were also provided contact information so they could contact the researcher with any questions or concerns regarding the study.

Additionally, pseudonyms were provided for the participants to maintain confidentiality. Participants were instructed to attend the virtual interview from a quiet and private room in their respective homes to preserve the confidentiality of the participants during the interviews (Arifin, 2018). The Zoom and Teams sessions were locked, and only the scheduled participant, or participants, were admitted to the interview or focus group session.

Recordings from the interviews, journal videos, and focus groups were stored on a password-protected personal computer in my home office. The only personally identifiable information that was stored included the participants' Demographic Survey and the pseudonym name list. The written notes from the reflections were stored in a locked safe in my home. Completed Google Forms (participant demographic information) were downloaded and stored in my house on an encrypted flash drive. Per the requirements of Liberty University's IRB, all data will be disposed of after three years.

Considerations were given to the potential risks the participants may face when participating in the study. These risks include experiencing stress during the interviews, feelings of inadequacy upon reflection on interview and focus group questions, and emotional distress or embarrassment during the focus groups. Participants were advised that should they experience emotional distress during the interviews, video journals, or focus groups. They may request that the interview or recording be discontinued and rescheduled for another date and time (Arifin, 2018).

Some of the benefits of participating in this study include increased knowledge of the outcome of the study, an increased sense of empowerment, participants actively contributing to socially valid research for a marginalized population, decreased participant sense of helplessness, relief at having their voices heard, and an increased sense of autonomy. The research has a high level of social validity. It can potentially increase the efficacy of the positive behavioral supports available for students with LFA who participate in VLE. The study outcomes may also present opportunities for teachers to self-reflect and provide direction on how to address students' needs effectively.

Summary

This study was designed to describe the issues related to the unique challenges experienced by Special Education Teachers of students with LFA and challenging behavior in VLEs. The transcendental-phenomenological approach is applied to explore the associated strengths and challenges of the matter while decreasing bias from the researcher. Through interviews, video journals, and a focus group, triangulation is achieved, and a holistic view of the phenomenon, the essence of it, is presented (Moustakas, 1994). Through a process of epoché and bracketing, phenomenological reduction of data into themes and horizons, development of rich textural and structural (by way of imaginative variation) descriptions of elements of the phenomenon, and synthesis of these refined components, the essential essence of the phenomenon was discovered, and a conclusion of the findings were obtained. The study's findings will contribute to future objective qualitative and quantitative research involving students with LFA. Moving forward, this study aims to mitigate the prevalence of inhibited progress for individuals with LFA due to a lack of equitable support by adding to the research supporting evidence-based interventions for these individuals.

CHAPTER FOUR: FINDINGS

Overview

The purpose of this transcendental phenomenological study was to describe the perceptions of special education teachers regarding positive behavioral supports for students with LFA and behavioral challenges who participate in virtual learning environments. This chapter will include a description of the participants, a presentation of the data, and an explanation of themes and sub-themes. Based on the analyzed data, themes were discovered in the areas of student preparedness and support, student engagement with instruction, teacher perceptions of the learning environment and student experience, and teacher and learning coach (typically parent or family member support) training. Research question responses will also be reviewed.

This study included participants who were Special Education Teachers of students from grades six to students who were 18-21 years old and participated in transition programs. All but one of the teachers identified as female. Participants included teachers from various geographic locations, such as California, Nevada, Arizona, and Illinois. All but two participants held a Master's degree, and two had either a Doctoral or Bachelor's degree as their highest level of education. Participants also varied in ethnicity, with six participants reporting their ethnicity as White, one as Black or African American, and three as Hispanic or Latino. Participant characteristics are detailed in the table format below.

Participants

Table 1

Participant Demographics

Teacher Participant	Years Taught	Highest Degree Earned	Grade Level	Geographic Location
Abigail	16-20	Masters	6th-8th	California
Aimes	6-10	Masters	9th-12th	California
Anna	6-10	Bachelors	9th-12th	California
Deborah	11-15	Masters	9th-12th	California
Elizabeth	6-10	Masters	9th-12th	California
Esther	More than 20	Masters	9th-12th	Nevada
Hannah	1-5	Doctoral	6th-8th	California
Mary	16-20	Masters	9th-12th	California
Ruth	1-5	Masters	6th-12th	Arizona
Tamar	6-10	Masters	9th-12+	Illinois

This study included Special Education Teachers who had a range of three to 20+ years of teaching experience. The participants included teachers of students from grades six through transition. One of the participants reported that they had earned a Bachelor's degree, eight reported having earned a Master's degree, and one reported having earned a Doctorate. All of the

teachers taught at least one student with Low Functioning Autism (LFA) and challenging behavior. There was limited variability in participant gender, including one male teacher and nine female teachers. Seven teachers were located in California, and the other three teachers were located in Nevada, Arizona, and Illinois, respectively. Participant profiles (using pseudonyms) are described below.

Abigail

Abigail is a White female Special Education Teacher in the 45-54 age range. She is married with adult children. Abigail teaches grades six to eight at a virtual public school in California and has taught students with special needs for 16 years. Before teaching, Abigail was a Board Certified Behavior Analyst (BCBA). Abigail received her first teaching credential in Texas but has been teaching in California for the last 10 years.

Aimes

Aimes is a White male Special Education Teacher in the 25-34 age range. Aimes started volunteering to work with students with special needs in high school. After high school, he became a para-educator and later earned his Master's degree in Special Education. Aimes currently supports high school students with special needs but has worked with students from preschool to transition. Before earning his moderate-severe special education teaching credential, Aimes worked as a behavioral technician, providing direct in-home support for students with disabilities. He is currently in his fifth year of teaching.

Anna

Anna is a White female Special Education Teacher in the 35-44 age range. She holds a bachelor's degree and has earned her moderate-severe special education teaching credential. Before teaching, Anna worked as a special education behavior aid for students with very

disruptive behaviors. Anna worked as a Special Education Teacher at a non-public school in California for 10 years prior to teaching online.

Deborah

Deborah is a Hispanic or Latino Special Education Teacher in the 34-44 age range. She has been teaching students with special needs for 15 years. Deborah currently teaches at a virtual public school in California. Before teaching online, Deborah worked as a Social Worker and later earned her Master's degree and moderate-severe special education teaching credential. Deborah currently teaches students with various disabilities, including levels 1, 2, and 3 autism, as a middle school teacher.

Elizabeth

Elizabeth is a Female Hispanic or Latino Special Education Teacher in the 34-44 age range who teaches virtually. Prior to becoming a teacher, Elizabeth was a paraprofessional. After earning her special education teaching credential, Elizabeth taught students from grades K through sixth grade. Elizabeth also worked as an educational advocate for low-income families for 10 years prior to her current position. Elizabeth has been teaching students with special needs for at least six years. She teaches high school students with special needs at a virtual public school in California.

Esther

Esther is a White Female Special Education Teacher with over 20 years of teaching experience. She is in the 55-64 age range and teaches students with disabilities in grades nine12. Prior to her current position as a virtual Special Education Teacher at a public high school, Esther worked as support staff at a school for students with autism. She later earned a master's degree as an Education Urban Practitioner and took additional college classes related to autism

and speech and language. As a teacher, Esther started working with preschool-aged children with autism in a hospital setting. Currently, Esther is an empty nester, but prior to that, she devoted much of her time and energy to supporting her son (now an adult), who has autism.

Hannah

Hannah is a Black or African American female Special Education Teacher in the 45-54 age range. Hannah has worked in education for 27 years, with 23 years supporting students as a special educator. Hannah has a PhD and has taught English and Special Education as a missionary in China. In addition to teaching high school students with special needs, Hannah is an adjunct professor, Interim Support Supervisor, and an Educational Advocate for juvenile probation. Hannah currently teaches middle school students online and in person.

Mary

Mary is a White female Special Education Teacher with 16 years of teaching experience. Mary initially worked as a health aid in an elementary special education classroom for medically fragile students. She later earned her Master's degree and special education teaching credential and worked as a Special Day Class teacher at a middle school. During the COVID-19 pandemic, Mary began working as a middle school Special Education Teacher at a virtual public high school. Mary has spent 18 or 19 years working in education, with 16 years as a Special Education Teacher.

Ruth

Ruth is a White female Special Education Teacher in the 45-54 age range. Ruth has earned a Bachelor's degree in developmental psychology with a minor in abnormal pathologies in children and youth. Her Master's is in brain-based learning in special education. Ruth teaches

ninth through 12th grade students with special needs who attend school online. Ruth has at least three years of experience as a Special Education Teacher.

Tamar

Tamar is a Hispanic or Latino female Special Education Teacher in the 35-44 age range. She has a Master's degree in early childhood special education and has taught for almost 10 years. Tamar works as an online and in-person middle school teacher for students with special needs in grades six through transition. Tamar supports students who participate solely online and in a hybrid educational model in which they attend school both online and in person. Tamar also has adult children. She currently works with students from immigrant families who have recently transitioned to the American educational system and have been enrolled in special education as an English Language Learner.

Results

The research questions in this study were based on a theoretical framework and included one central question and three sub-questions. Participants took part in a semi-structured interview whereby the theoretical framework of Thorndike's Laws of Learning was explored. Participants also engaged in a focus group whereby participants' experiences of the phenomenon were further explored. Lastly, participant responses to a video journal prompt elicited data regarding future trainings and teacher effect regarding the phenomenon. All participant quotes refer to an experience within the VLE unless otherwise stated.

Student Preparedness and Support

The first theme revealed in this study is student preparedness and support, along with the subthemes parent/caregiver support and teacher supports. Based on the data collected from all three data collection sources, teachers observed that students who required more significant

support to be present or access the learning environment relied heavily on receiving support from an accompanying adult or family member. Students specifically relied on physical and proximity supports from a nearby adult. Ruth shared one experience that was also a common experience described in most of the interviews. Ruth shared:

> In terms of my kids, it's that they can't set this up for themselves. They can't turn on the laptop. They can't get to the website. They don't know how to adjust the volume. They don't know how to plug it in so it doesn't lose its charge while you're working. They need [support]. . . they need someone to at least do that part for them. I think that was the biggest problem.

For example, Abigail, Tamar, Esther, Anna, and Hannah spoke on the importance of physical proximity and touch when providing the necessary prompts to support student learning. The topic of touch and physical prompting was also a point of discussion in four of the 10 video journals.

Teachers also agreed that support from online staff (including teachers and support providers) and their provision of accommodations also impacted student preparedness. In their interviews and video journal responses, three providers specifically mentioned accommodations as a support component, while others described various accommodations they regularly observed in their classrooms. When speaking about student readiness, Ruth said, "I don't know that any of the students can actually sit down and turn the laptop on and get themselves to the place they need to be. They rely on a parent or caregiver." More specifically, Ruth explained this about students who were non-verbal and who did not have parental/caregiver support but were present in class, "We can only look at each other, but you know if they don't answer me when I talk, and they're not responding to you know the questions I'm posing them, then they're not able to

access the learning." Ruth's perspective is one that the group of teachers shares, and it is reflected in how the teachers expressed their limitations in supporting their students online while stressing the importance of students receiving support from their parents/caregivers.

Parent/Caregiver Support

Nine out of 10 teachers agreed that students were more successful when the parent or caregiver was physically available to support the student and when they were knowledgeable regarding how to utilize the technology appropriately and effectively. When speaking about successful learning environments during her video journal entry, Ruth stated, "First of all, you have to know what the home has available to facilitate that student's learning, and to make sure that parents and students are capable of using that equipment." All but one of the teachers agreed that one of the biggest challenges of supporting their students virtually was that the technology provided (namely the camera, microphone, and computer monitoring software) was often unused throughout the school day. Challenges related to parent use of technology were reported across all data collection sources. In their interviews, at least two teachers described situations in which they provided parent/caregiver training on how to use the technology. In contrast, one teacher expressed during the focus group that she wanted to provide similar parent/caregiver training.

In addition to parents/caregivers not knowing how to use the technology to support their student, several teachers spoke of at least one situation they experienced in which the parent of a student refused to use the technology given to them by the school or teacher. Esther said:

> I have some families that won't use our technology . . . it appears to me that it's our (students with) highest behavior, physical behaviors going on . . .the lowest level pre-readiness skills . . . If I don't have access to what's going on there, I can't tell you who's

on task, off task, or are they there? I don't know. Are things being clicked? Who's clicking it? I could have data. Is my data valid because I don't know who's doing it? During the focus group, participants also discussed the impact that a lack of digital tools and technological supports had on students and the support they received.

When asked about the most significant challenges to student learning in the VLE, most teachers described a limitation in their ability to observe and/or interact with their students and monitor engagement via the camera, microphone, or indirectly through the parent. Teachers stressed the importance of parent/caregiver support across all data collection methods, providing various examples of how parents/caregivers were able to actively support their students during the live class sessions. Six out of 10 teachers explained that they encouraged parent/caregiver involvement by sending physical items such as manipulatives, worksheets, and positive reinforcements to the parents/caregivers and asking that they support the students in using the items during class.

Teacher Supports

In addition to challenges in parent/caregiver support, teachers unanimously expressed difficulties related to teacher support. All study participants cited limitations in their ability to provide their students the necessary supports (primarily physical and proximity). While some mentioned sending educational materials to the student's home address to help with student anxiety and preparedness, many shared Mary's sentiment in saying that:

> Usually, there's not a lot I can do or say in this virtual environment, honestly, that is going to majorly change that. I feel it's more of like getting on the phone, talking with the parent, and helping them help the [student]. You know, supporting the parent really, and working through whatever issue [the student] is having.

Participants across all data collection methods described challenges in their ability to support their students in the virtual environment, identifying an inability to monitor or observe students as one of the top three challenges. Elements related to parent/caregiver support were the most frequently coded items in this study.

Because of the limitations in teacher support, like Mary, the teachers shared how their ability to support the students was connected to their ability to collaborate with the parent/caregiver who could provide immediate and direct support. In this sense, the parent/caregiver support served as an extension of the teacher's support. Teachers were more effective in supporting their students when the parent/caregiver was present with their students and willing to collaborate with the teacher. Conversely, the teachers shared that they experienced more frustration and felt less effective in supporting the students when the parent/caregiver was not present, could not be reached, or did not follow through on teacher requests related to student engagement and support.

In addition to sharing feelings of frustration and helplessness, teachers agreed that limitations in the cues they could provide may have hindered student receptiveness and understanding of the learning objectives. Elements of this were seen in participants' descriptions of the cues they could provide the students. When discussing supports related to Applied Behavior Analysis (ABA) and Evidence-Based Practices (EBP), teachers frequently mentioned the need to use leveled prompts to support the students and encourage student independence in the VLE. When asked about learning challenges that the students faced, Aimes said:

> It's hard to put a finger on it, but there's something lost in communication between watching on the video versus seeing somebody in person. I think maybe it dulls the facial expressions that we have, which is already kind of an issue for students with autism to

> digest. So having a kind of 2D format can make it a little bit more difficult for them to understand what you're trying to communicate . . . It just has a different effect on the mind . . . It's like you're not being involved at the moment.

Teachers generally agreed that students experienced difficulty with grasping certain concepts due to a lack of proper application of ABA and EBP strategies.

Across all data collection methods, teachers generally felt that they could not fully apply the prompting supports that their students needed to increase their level of independence in the VLE. Teachers admitted that they were limited to providing primarily verbal and visual supports to their students, which was much less than what they could provide in the brick-and-mortar environment. Tamar compared the teacher's ability to provide support online versus in person when she said:

> Online, I don't have the ability to have that tactile where, you know, with this particular student that has the hypersensitivity, if I touch his hand, he knows, 'Oh, Ms. Tamar's touching me,' and he's like [makes a face and shakes head no]. And I'll say, 'John, it's time to focus', and then he'll look at me . . . and then online, how do I do that?

In addition to Tamar's comment about limitations in her ability to prompt her students online, Mary's comment about the teacher's role in the VLE is another one of the many statements that gave credence to this notion of teachers feeling limited in supporting the students. In her response about student readiness, Mary said, "So much has relied on the students having to be able to read the assignments, and if they're not visual learners or good readers, they just don't understand." Teachers generally agreed that student success in the VLE was linked to the student's ability to function with a greater level of independence or the amount of support the student had in the home.

Because of the limitations in contact and environment control that teachers faced in the VLE, teacher support was less of a determining factor of student success in the VLE. Each of the teachers shared a unique experience in expressing what they believed were limitations in their ability to support the students. Teachers agreed that not only were they limited in their ability to support their students, but the teacher's support was only one part of the answer to how to support student success in the VLE. They agreed that collaboration between the teachers and the student's parent was ultimately a key factor of student success in the VLE.

Student Engagement and Instruction

The second theme revealed in this study is student engagement and instruction, along with the subthemes connecting with instructional opportunities, routines, and repetition. Teachers agreed that certain instructional elements had a more significant impact on strengthening student learning and engagement than others. It was also generally agreed that when repeated over time, these same elements similarly impacted the student's ability to overcome the limitations of their learning environment. When commenting about successful strategies that were used regularly for strengthening student learning, Tamar said, "Obviously, that's done by demonstration . . . you know, we expose them, we show them, we repeat it." This statement is just one of several comments that the teachers made across all data collection methods, in which they noted the importance of automaticity in which they implemented routines and repeated practice.

In addition to routines, repeated practice, and instruction, 10 out of 10 teachers explained that they also used multiple modalities to teach their students and help them access and connect with the instruction. They reported using various modalities to reinforce student learning and increase access and engagement. Esther said this about supporting student engagement for a

lesson on baseball: “I can actually fake it and show like I’m throwing. We could be discussing it, we could be looking at the picture, and then [creating] practical situations.” Esther also demonstrated using verbal commands to prompt the students to use multiple modalities by providing prompts such as “show me” and “put on this Only two other teachers shared moments in which they used similar prompts to support student engagement and “make it real life.” While some teachers regularly encouraged the students to participate using multiple modalities, all teachers regularly used numerous modalities in their instruction. Teachers agreed that a multi-modal approach to student engagement and online instruction was most effective. All teacher participants agreed that regular visuals, realia, and multisensory integration supported student engagement in the VLE.

Connecting with Instructional Opportunities

Overall, teachers reported regularly using visuals, short, concise instruction, and differentiation to provide students with various opportunities to connect, respond, and continuously engage with the instruction in the VLE. Teacher experiences resonated with Elizabeth’s comments during her interview when she spoke about helping students make connections and take full advantage of instructional opportunities. When hearing her students sing songs to remember multiplication facts, Elizabeth recalls responding with:

> ‘Yeah! Make that connection and make it your own. If you have to count by twos, then that’s what you’re doing.’ Then they see me count with my fingers because they have to see that you use every tool available to you.

Teachers reported using various strategies and modalities to help their students connect with the instruction in the VLE. Some also shared that this was an area where they would like more support from their administrators. Aimes, for example, shared during his video journal that

training on how to "really engage with the lesson, or how to keep their attention" is needed for the educational staff and family members who support students with LFA online.

Additionally, during the focus group, teachers reflected on the strategies they used to help students connect with the learning. For example, Anna's comments about the necessity of visual supports were reflected across all data collection sources from multiple participants. While routines and visuals were two highly coded items related to this sub-theme, participants admitted that more strategies for differentiating instruction in the virtual environment were needed. Teachers also agreed that supporting the students through accommodations and differentiated instruction was vital to providing the students with instructional opportunities that would support student success. Elements of this were seen throughout all data collection methods.

When asked about strategies to strengthen student learning, Esther explicitly said what most of the teachers shared anecdotally when she explained the importance of "differentiating that instruction, not only the instruction but what it is they are specifically working on. My lower functioning students . . . it's on pre-readiness skills." In both the video journals and interviews, Esther and others shared some strategies they used to address the needs of students with hyposensitivity and help them connect with the instruction and capitalize on instructional opportunities. Esther shared, "We'll tell them to stand up and jump or go get something for me so that they can actually, you know, put pressure on their body with the movements of walking and bringing something over." Tamar explained that she incorporates multisensory elements by providing instructional opportunities that are aligned with CHAMPS (Conversation, Help, Activity, Movement, Participation, Success) goals to help the student get the most out of every instructional opportunity. Elizabeth also shared her experience, saying:

> There's an accommodation for a handful of our students that have trampolines and bouncy balls, and they do not participate in polling because they're either on their mountain bike, their trampoline, or doing some kind of physical activity, which is the only way they can actually focus on mathematics . . . So the only way they could make the neurological connection is to be physically, completely physically active to exhaustion."

Elements demonstrating the importance of making connections between the students and the instructional opportunities were expressed throughout all data collection sources. During the focus group, when asked about the most successful practices, the participants described the methods they used to make connections and support student engagement, with several sharing that they used some of the same strategies. Outside of responses about training during the focus group, and in addition to being mentioned across all interviews and in some of the video journals, participants agreed that in the VLE setting, it was essential to support students in making connections and engaging with the instruction by differentiating the instruction and experience.

Routines and Repetition

Teachers agreed that by providing the students with repeated instruction and opportunities to practice learning concepts and teaching the students classroom and instructional routines, the students were more likely to be successful and willing to engage in the instruction. When asked during her interview about the most frequently used strategies to strengthen student learning, Abigail commented, "Repetition is the cornerstone . . . it's repetition, repetition, repetition . . . every single day." Additionally, most teachers, like Deborah, shared that in

addition to repetition, one of the most successful practices they use with her students with LFA in the VLE has been having a routine. During the focus group, she stated that:

> We start our sessions off the same way. We use the same transitions all the time. So there is kind of a queue and they get used to that. Just a lot of routine and consistency . . . within our sessions. Just keeping them very structured.

Teachers reported that regular implementation of a routine and providing the students with multiple opportunities to practice learning concepts was key to student success in the VLE.

Learning Environment and Experience

The third theme revealed in this study was learning environment and experience, along with the sub-themes reinforcing student actions, student anxiety before and during instruction, incorporating student interests, and making learning enjoyable. Teachers agreed that certain environmental factors and methods of reinforcing student behaviors significantly impacted the student's ability to overcome physiological adversities and be successful in the VLE. Providing appropriate reinforcement to student behaviors and creating a pleasurable learning experience were two factors touted as vital to students' success in their online classes. These factors were also two of several strategies expressed across all data collection sources that participants shared as strategies to address student anxieties directly or indirectly and increase resiliency among the students.

When asked during her interview about successful evidence-based strategies she used in her online class, Esther commented, "Positive reinforcement, man, that goes a long way." The teachers unanimously shared Esther's comments on positive reinforcement and its effect on the students. Across all data collection sources, positive reinforcement and providing a pleasurable learning experience were the second and third most coded items under the learning environment

and experience theme, gaining 39 and 25 mentions, respectively. Regarding strategies that were used to support students in the VLE, the sub-themes of reinforcing student actions and providing a pleasurable learning experience were only surpassed by the sub-theme of parent/caregiver support. During the focus group, when asked about the most successful strategies to support student success, Abigail mentioned putting on the Abigail show and "being excited to learn so that they can be excited to learn." It was evident that the teachers also used this notion of providing a learning experience that included both strategic reinforcement of behaviors and satisfying interactions to address student anxiety during instruction. This was evidenced when most of the teachers shared that, like Aimes, who said, "I try to manage my voice to make it calm and . . . somewhat interesting . . .which makes it kind of nice." They also employed various sensory-related tactics to make learning enjoyable while also addressing behavior-related pathologies such as anxiety and hypersensitivity.

Reinforcing Student Actions

Although the teachers agreed that providing positive reinforcement to appropriate student behavior was a critical strategy they frequently used in their online classes, some teachers also reported challenges that arose when positive and negative reinforcements were not appropriately provided within the home and VLEs. In her interview, Hannah explained, "I think positive reinforcements are key…If the parent doesn't reinforce that regularly within the home, you trying it virtually is a big mistake." During the focus group, teachers agreed that it was important for the parent/caregiver and teacher to be aware of prompting hierarchies as a system by which positive and negative reinforcements could be appropriately issued. Three teachers explicitly mentioned positive reinforcement in their video journals, while seven participants expressed

elements of this theme in their video journals. All participants examined their methods to provide positive reinforcement in their interview responses.

While positive reinforcement was generally valued as the preferred reinforcement method and regularly provided by all of the teachers, some participants also described situations in which negative reinforcement was provided. Participants who spoke about negative reinforcement viewed it as challenging to student success in the VLE. Hannah explained that providing negative reinforcement to appropriate student behavior in the VLE was not very productive and "ultimately lead to a lot of frustration." Several other teachers also shared experiences in which students had attempted to say or do something (such as communicating with peers or adults), but their actions were negatively reinforced. For example, Esther shared:

> Some of my students who are academically higher functioning but they don't have that complete social competency, they'll start typing in a chat, and there could be 100 students in a Gen. Ed. class and some of the other students are like, 'Ok, what are you doing?' And now my students are getting picked on.

Many teachers viewed negative reinforcement as a catalyst for more problematic behaviors from the student.

Elizabeth shared a similar experience in which a negative reinforcement led to frustration for one of her students:

> They're in a class where they're lost and they're trying their best to keep up, but they're so behind that when they find that one thing that clicks they don't know how to control their excitement. So they blurt out, and it's inappropriate at times. And the anxiety happens if someone else makes a comment in the chat, or they catch it and it's received unkindly by an adult [because] the adult has no idea who my student is, or one of the

> other students finds the behavior to be different and makes a comment, then the student catches it and begins to unravel and sometimes becomes either aggressive or they shut down completely for the rest of the day.

Although all participants did not share actual experiences in which student behaviors were negatively reinforced, elements of improper reinforcement were seen in participant responses across all three data collection sources. During the focus group, participants agreed that the "learning coaches don't always know" how to help their students by providing supports such as positive reinforcement. Not only did this sometimes lead to frustration for the students, but this was only one element of the VLE that could, as Deborah stated in her video journal, "take a toll on the level of anxiety or stress" for parents of students with LFA in the VLE.

While most of the teachers reported situations in which a student became frustrated when a teacher, parent, or caregiver gave them an unfavorable response regarding some action they presented, four out of 10 teachers also provided examples of when they experienced the parent becoming frustrated when attempting to support the student. In the focus group, Elizabeth described a situation in which a parent became "frustrated because their student [wasn't] able to keep up with our pacing." Ruth also shared an experience in which the parent became frustrated. She described a situation in which she attempted to address a student's challenging behavior by collaborating with the parent to provide in-person support to the student. She shared, "It was not effective to have parent in the room because they get frustrated when their kids don't behave." Teachers agreed that the parents/caregivers were not equipped or trained to address challenging behaviors their student presented effectively. Abigail echoed the perspectives of the teachers as a whole when she said in her video journal answer:

> I feel like our learning coaches are sort of acting like paras with no para training. So it would be nice to have maybe put together like a paraprofessional training but geared towards parents. So they really need like some, I would say, introductory ABA type principles.

During the focus group, teachers agreed that parents and teachers alike could benefit from training on how to support students by appropriately addressing behaviors using strategies such as ABA and strategic reinforcement of behaviors for students with LFA in the VLE.

Student Anxiety Before and During Instruction

Teachers agreed that implementing strategies such as sensory integration, frequent breaks, and encouraging communication through student check-ins before and throughout the class session was vital to increasing student engagement and mitigating the effects of anxiety, which, if left unaddressed, would eventually cause eloping and student shut down. Most teachers began their lessons by singing a song, watching a short video, engaging in a breathing exercise, reviewing a student check-in, and reminding the students of different ways to communicate their needs and use their coping strategies throughout the school day. When asked about student readiness during the interviews, every teacher described using at least one of these strategies as an element of readiness. During her interview, Hannah provided insight resembling the collective experiences of the teachers when she said:

> You just have to try your best to find what atmosphere works. What temperature. What lighting. What they need to hold. And when you find that recipe for success for that particular job, you run with that vision and you keep implementing it on a regular basis.

Elements of strategies used to address student anxiety before and during instruction were revealed across all data collection sources.

In her video journal response, Ruth suggested providing students with a less inclusive virtual learning environment as a means of addressing student anxiety, stating that from her experience students with autism "simply do not learn in the same way [as other 'low functioning students'], and then they have anxiety and they have behavioral issues that need to be addressed." In their interview responses, Mary and others mentioned that "in this environment [the VLE], it's much easier for them to avoid things when they're feeling stress and anxiety." While only one participant described moving students to a less inclusive environment as a means of addressing student anxiety, others described using pre-emptive measures, such as priming and review, to address student anxieties before they developed into behavioral issues. Participants described using various strategies before and during the first few minutes of class.

Across all data collection sources, and in several instances throughout the focus group, participants explained their efforts to mitigate student anxieties in the VLE caused by the unknown. For example, during the focus group discussion, Anna shared, "With autism, I feel they need to know what's coming up next in order to be able to focus on what they're doing." Most participants described addressing student anxieties at the onset of their live class sessions. For example, when asked about anxiety during his interview, Aimes stated, "a lot of their anxiety comes from just speaking I've noticed. So I try to start every class by saying like 'Hey, how are you?'" While some participants shared strategies for addressing student anxieties before and at the onset of the school day, some also described their efforts to address student anxiety throughout the school day by focusing on creating a pleasurable learning experience.

Incorporating Student Interests and Making Learning Enjoyable

Teachers collectively and regularly incorporated student interests into their lessons and engaged in tactics that created an enjoyable learning environment for the student and supported

student buy-in. One strategy was cultivating a desire among the students to engage in the learning environment. Many of the teachers incorporated practices like Anna, who said, “I try to aim my lessons at maybe something, if I can tie something that they enjoy in . . . especially on Fun Fridays and stuff, we’ll tie in some of the things that they’ve been wondering or thinking about.” In addition to incorporating student interests into the lesson, some participants also incorporated visuals of preferred items in other aspects of the VLE.

When describing a self-created rewards system during her interview, Tamar described using different visuals to keep track of student points. She explained using visuals such as “fruits, or jelly beans, or other candy pieces like a candy crush kind of thing.” During the focus group, Anna and others agreed with Deborah’s comment about how students with autism require visual supports to support learning in the VLE. The group discussed how understanding how to incorporate students’ multisensory interests was an area in which they needed more training.

In addition to sharing unique methods they used to incorporate student interests into their lessons, some participants described other efforts to make learning an enjoyable experience. Some participants described making efforts to positively influence the class's morale by increasing their excitement. For example, in an interview response, Abigail said, “If I’m excited about them, they can be excited about being there.” Across all interviews, participants described and/or demonstrated efforts they regularly made to make learning enjoyable by being excited themselves, with some describing their efforts as an “awesome” spectacle. In his video journal response, Aimes echoed this desire among teachers in the VLE to have more strategies by stating that teachers needed training on how to help students with LFA to “really engage with the lesson or how to keep their attention.” Across all data collection sources, teachers shared experiences

supporting the notion that incorporating student interests and making learning enjoyable was an essential component of supporting student learning through the law of effect.

Teacher and Parent/Caregiver Training

The fourth theme revealed in this study is teacher and parent/caregiver training, along with the sub-themes teacher training and parent training. Teacher and parent/caregiver training was one of the most heavily expressed themes across all data collection methods and from all teachers. Teachers unanimously shared that they experienced a significant lack of training and felt that the training they received was inadequate to prepare them for teaching their students online. In her video journal response, Anna said:

> I believe that we need more trainings especially in the virtual learning environment on how to get that student participation from students with low functioning autism. It can be very difficult, especially when the student is non-verbal and cannot type, to get any sort of valuable data regarding their abilities.

In addition to a lack of relevant and autism-specific training for teachers in VLEs, teachers also felt that the parents/caregivers would benefit from training. When the teachers were asked about their history of training to support students with LFA online, some shared that they had received training at their previous brick-and-mortar school site. All the teachers said they had not received any training on this specific topic relevant to supporting students in the VLE.

When asked during the focus group about training to support students with behavioral challenges online, Anna's comment echoed the group's experiences when she said this about training, "I feel like I got a lot from the NPS, but none of it probably pertains virtually." Additionally, during the interviews, most of the teachers shared at least one experience when they were limited in their ability to support the student, and it was incumbent upon the

parent/caregiver to provide support. In many cases the parent/caregiver either provided inadequate support, which incited student behaviors, or they did not know how to support the student and instead removed the student from the learning environment altogether. Some parents/caregivers did not address the behavior at all. During the focus group many of the teachers agreed with Abigail's sentiment when she said, "I wish we had training so we can help the learning coaches and the parents. I wish we could help them." Teachers agreed that parents/caregivers and the teachers were significantly undertrained to support their students with LFA in the VLE.

Teacher Training

Teachers agreed that although they had received general training in their current positions as educators of young minds, little to none of their training had been autism specific or relevant to supporting the needs of students with LFA in the VLE. Like others, Mary's experiences demonstrated the need for teacher training for students with sensory-processing issues. During her interview, when asked about meeting the needs of students challenged by hyposensitivity, Mary said, "That's really hard in this environment." In eight out of 10 interview responses regarding educational background, the participants described beginning their educational careers in positions where they were qualified to provide direct support to students with behavioral and health challenges. However, like Anna, most participants shared that they received less strain in the VLE than in the brick-and-mortar school environment.

Teachers also expressed concerns that the trainings they received were not specific to addressing the most common behavior-related occurrences and areas of need for their students with LFA in the VLE (such as challenging behaviors, sensory integration for students with LFA,

social communication, and parents/caregiver support). When asked about receiving trainings to support students with sensory abnormalities, During the focus group Elizabeth asserted:

> I guess I was lucky because in one of our PDs, there was a slide that was focused, and they touched upon it, but they didn't offer great help. They mentioned it and said that further training can be provided, and that's as far as they got.

Elizabeth was the only teacher who participated in this study who responded that they had received any training related to this field of teaching. Everyone else said they had received no training in this area. All teachers agreed relevant and consistent training for teachers of students with LFA was essential to these students being successful in the VLE.

Parent Training

Teachers agreed that relevant and specific training for parents/caregivers regarding supporting their students was also essential to student success in the VLE. Across all data collection sources, teachers described elements indicating that one of the biggest challenges they faced when addressing behaviors among students with LFA in the VLE was being limited in the type of support they were able to provide the students, especially in times when the students demonstrated challenging behaviors and needed the most support. In her video journal response Esther said this about the trainings for people who support students with LFA in VLEs: "Behaviors really need to be worked on first, so behavioral trainings are critical. Training family members is critical because we all have to work as a village to raise the child." This statement supported the notion that parent and teacher training was essential to effective collaboration.

When asked during her interview about supporting students by implementing positive behavioral supports online, Hannah said, "That ability to elope or fall out and have a tantrum per se is very much a viable option depending on how they handle that student in the home." Most of

the teachers provided responses that were aligned with these statements. Teachers agreed that due to their proximity to the student, it was pertinent that parents/caregivers receive training on how to physically meet their students' needs. Some teachers also wanted teachers, parents, or family members to receive the same training. During the focus group, when asked if there was anything else that anyone would like to share regarding their experiences in supporting students with LFA in VLE, the teachers unanimously agreed with Abigail and Elizabeth when they said, "I would love more training and topical training. It just hasn't happened," and "I wish our PDs were segregated so that it was actually focused on our population." Although the need for parent/caregiver and teacher training was commonly expressed throughout all data collection methods, Teacher training was the most common expression in the video journals.

Research Question Responses

Several themes were noticed when collecting data for this study. In many ways, these themes and subthemes were directly and indirectly related to the research questions in this study. The following section connects the research questions to the overall essence of teacher responses in each area.

Central Research Question

What are the shared experiences of Special Education Teachers who implement positive behavioral supports (PBS) for students with LFA and behavioral challenges who participate in an academic virtual learning environment?

The teachers overall agreed that while there was lots of flexibility regarding supporting their students online through strategies such as using visuals and front loading, they were limited in their ability to implement positive behavioral supports. Deborah said, "In the virtual setting, I'm pretty much limited in the type of prompting that I can provide when they are learning . . .

besides the visual and verbal I can't really be there physically unless their learning coach is with them."

The teachers also agreed that they and the parents/caregivers were severely lacking in training on how to address the underlying factors of challenging behaviors (i.e., social communication deficits, abnormal sensory interests, hyper- and hypo-sensitivity, etc.) and that they needed more specific training on how to support students with LFA in online environments effectively. When asked to share about her experiences supporting students with LFA and challenging behaviors in VLEs, Deborah, agreeing with Abigail, shared:

> I think for me it's the same, more training . . . and then giving learning coaches optional trainings if you want to learn a little bit more about how to work with your student in the virtual learning environment, because a lot of them they get started and it's just like hectic. So I think just having more optional trainings for learning coaches on how to work with their students, especially if they have autism, or just pretty much any other disability that makes it harder for them to work on the computer and work more independently. So that would be great. Besides more trainings for myself on how to do that virtually, because yeah, I think we're just going with whatever resources we currently have, and I think there should be more.

This statement resonated with the collective perspectives of the teachers in this study in that the teachers expressed that the systems currently in place within their schools were not supportive of the needs of students who frequently relied on direct support for PBS to be successful in the VLE. Due to limitations specific to the nature of VLEs (i.e., use of technologies such as camera and mic to participate and access instruction) in addition to constraints regarding parent/caregiver and teacher training and preparedness, the teachers viewed the implementation

of PBS as a significant challenge in addressing the needs of students with challenging behaviors in the VLE.

Sub Question One

How do teachers experience the essential components of readiness among students with LFA in an academic virtual learning environment?

The teachers overall valued and regularly implemented a daily routine that included strategies such as reviewing an agenda or visual schedule, reviewing/practicing pre-readiness skills and priming for transitions, reminding the students of their coping mechanisms, and frequent student check-ins. The teachers also regularly communicated with the students and offered additional explanations and repeated instructions. Lastly, the teachers prioritized collaboration with the parent/caregiver to gain insight into the morning the student had before class. When asked about the essential components of readiness in her online class, Hannah explained how important it was:

> The kids are aware, prior to starting the lesson, what we are going to work on, and I also try to ensure that the parent that is there is aware prior to that time and kind of priming the student beforehand of what we are going to be working on.

Overall, the teachers shared the same perspective on viewing the acquisition of pre-readiness skills as vital to the students' ability to attend and participate in the VLE. Additionally, the teachers viewed parent priming (from teacher to the parent and from the parent to the student) as an essential element of student readiness. When the parents were prepared before the lesson, teachers saw more engagement from the students during the lesson.

Sub Question Two

How do teachers experience the essential components of exercise among students with LFA in an academic virtual learning environment?

The teachers valued and regularly implemented strategies such as repeated practice, concise or simplified instruction, repeated instruction, lesson differentiation with multiple response and engagement options, use of realia, sensory integration, and review to support students in connecting to the learning. Esther offered, "What is considered having the student engaged and participating in class? What that looks like and what it does . . . What does it look like to have our students be more independent on this platform?" Some of the teachers provided a response to Esther's inquiries about student engagement. Tamar and Ruth shared that they will adjust the lesson to support student engagement when they notice that the students are becoming disengaged. Ruth said that she "finds a way that repetition doesn't become dull." Tamar said, "When I start seeing them like kind of zone out, then I have to start using those recall methods and start being able to . . . like exposing something else or doing another drill with them." Teachers reported using multiple instructional modalities to provide engaging opportunities for the students to participate in the learning environment.

Overall, the teachers also incorporated student interests to create positive stimulus-response pairings and increase student learning motivation. Mary said, "I do a lot of trying to pull in student interests…so they can get more buy-in." The teachers also expressed that using multiple tools (such as responding in the chat, using the poll to respond, and incorporating sensory elements such as song or dance) helped their students engage in the instruction. Tamar shared that, like some other teachers, she "will actually do physical movements with the students because part of that physical movement is what helps them to remember." In addition to

providing multi-modal instruction, teachers strategically provided opportunities for movement and utilized strategies that required multi-sensory engagement to meet the unique needs of their students.

Sub Question Three

How do teachers experience the essential components of effect among students with LFA in an academic virtual learning environment?

The teachers collectively valued and prioritized strategies that helped them to provide a pleasurable learning experience for the students. Teacher experiences aligned with Aimes' comment about positive reinforcement: "A lot of students like that. I'll be like, 'Okay, great job with your answers,' even if it's not for correct answers but just for participating. I'll also give some praise. It just depends on the student." Teachers place high importance on providing immediate and consistent positive reinforcement to their students.

Although positive reinforcements and rewards were consistently doled out to the students, teachers experienced significant limitations in strengthening student learning by addressing maladaptive behaviors using these tactics. They collectively relied on parent/caregiver support to address and shape behaviors by reinforcing appropriate behaviors. When speaking about relying on the parents to support student needs, Mary said:

> Obviously, I don't want to lean on them for everything, but, like, there are some students that are, you know, the only way they kind of have success in this environment is with their parents being actively involved. I tried to engage, and I tried to do things that are going to appeal to them and catch their interests so I can kind of get them motivated, but I do have a lot of students that if they don't have their parents there, they are just either zoned out or they leave, and it just creates a pretty bad cycle. So I think that I have to

> unfortunately rely on the parents for that a lot, just because I'm not sitting there next to them.

Due to limitations in teacher control, parent/caregiver and teacher collaboration was essential to support the effect among students with LFA in the VLE.

Summary

This chapter provided a description of the research results from all data collection methods. A description of the most notable themes and subthemes was provided. One theme identified was student preparedness and support, along with the subthemes parent/caregiver support and teacher support. Another identified theme is student engagement and instruction, along with subthemes connecting with instructional opportunities, routines, and repetition. The identification of a third theme, learning environment and experience followed this theme. This was connected to the supporting subthemes of reinforcing student actions, student anxiety before and during instruction, incorporating student interests, and making learning enjoyable. The last theme identified in this study was teacher and parent/caregiver training, along with subthemes teacher training and parent training. Each of these themes has a unique connection to the purpose of this study. In the next chapter, an interpretation of this connection is presented in light of the study's research questions and theoretical framework.

CHAPTER FIVE: CONCLUSION

Overview

The purpose of this transcendental phenomenological study was to describe the perceptions of special education teachers regarding positive behavioral supports for students with LFA and behavioral challenges who participate in virtual learning environments. In this chapter, I discuss the findings in this study and provide my interpretation of the data. I also discuss the implications for policy and practice and the theoretical and methodological implications. Lastly, I will discuss the limitations and delimitations of the study and recommendations for future research.

Discussion

The themes and results of this study have been explained objectively. The connection between the themes, research questions, and sub-questions has been explained with supporting evidence from the focus group, interview, and video journal responses. The following section includes an interpretation of the results and data analysis as it relates to the purpose of the study. Connections to theoretical and empirical sources are also provided to support the interpretation of the findings.

Summary of Thematic Findings

One theme that was discovered was the theme of student preparedness and support. In this study, teachers collectively stressed the importance of student preparedness and support, citing their experiences related to teacher and parent/caregiver support and preparedness and its effect on student readiness. This theme was directly related to sub-question one as it revealed teacher experiences associated with the concept of readiness for students with LFA in VLEs.

Concepts such as pre-readiness skills, frontloading, and regular implementation and priming of class schedules were significant findings here.

The second theme in this study was student engagement and instruction. Subthemes identified here relate to instructional opportunities, routines, and repetition. Teachers generally experienced that by helping the students connect with the instruction practically and conceptually and by pre-teaching routines and providing lots of repetition, the students were more successful in engaging in the instruction. This theme and subthemes shed light on teacher perspectives regarding the law of exercise.

The theme of cultivating a robust learning environment and educational experience was also revealed. Specifically, this involved consistently reinforcing appropriate student actions, addressing the underlying issues of challenging behaviors (namely anxiety), and incorporating students' interests to provide a satisfying learning experience. The thematic findings in this area also directly impacted the central research question, as the thematic elements directly involved implementing behavioral supports and interventions. These themes and subthemes were directly related to the law of effect and indirectly to the laws of readiness and exercise.

The last theme discussed was teacher and parent/caregiver. Overall, this was the most significant point of concern for the teachers, garnering a significant number of mentions across all data collection methods. Teachers collectively felt insufficiently trained to meet the needs of students with LFA in VLEs adequately. Teachers shared the same perspective regarding parent/caregiver training or lack thereof. This theme has a significant impact on the discussion of future implications and policy. Collectively, the themes and subthemes identified in this study offer valuable insights regarding the Laws of Learning as it relates to supporting students with LFA in VLEs.

Interpretation of Findings

Several themes were discovered in this study. Along with the four themes that were deduced from the data analysis, nine subthemes were also revealed. The following interpretation of findings results from considerations given to the data collected, research questions, and purpose of the study. A connection is also made to the theoretical framework of the study.

Essential Components of Readiness

The first research sub-question in this study explored the essential components of readiness among students with LFA in academic VLEs. The results showed that student preparedness and support were significant factors in the experience of teachers of students with LFA in the VLE. Some elements identified were the use of visuals, frontloading or pre-teaching basic skills, reviewing visual schedules, and ensuring that the student had access to accommodations and was mentally and physically prepared to learn. Not only did teachers express great concern for the type of support that students with LFA received in the online environment, but the data suggests that teachers also valued the level of preparedness of the parent/caregiver and teacher working with the student.

When asked about any final thoughts about teaching students with LFA in the VLE that they would like to contribute to the study, over 50% of the teachers' final comments across all interviews and the focus group were related to parents and teachers being trained to support students with LFA in the VLE effectively. Comments like Anna's response to the video journal highlighted the position that all teachers expressed across all data collection methods. In her response, Anna said:

> I also think it would be helpful for parents and teachers to work more closely together, so maybe having some sort of training on that, because with students with low-functioning

> autism, there does need to be consistency between the home environment and the school environment to really make things stick. So, I do feel there could be more training on collaboration between the family of the home environment and the school.

The data collected revealed a clear connection between students having the necessary accommodations and curricular supports, support from adequately trained teachers and parents/caregivers, and student success. Teachers seemed to experience greater student success when both elements were present.

This finding aligns with research by Stenhoff et al. (2020), which outlines the challenges that students with LFA faced while participating in the VLE. The authors outlined the lack of adequate teacher or caregiver training, lack of digital literacy skills, and accommodations or sufficiently modified curriculum as challenges to participation. The data analysis reveals several elements that may serve as viable strategies to ensure student preparedness for the learning environment and strategies to mitigate the previously described challenges. By regularly providing lessons with eye-catching visuals, reviewing a visual schedule daily, pre-teaching the necessary pre-readiness skills (such as following a routine), and having the necessary accommodations prepped and ready to be implemented by trained teachers and trained parents/caregivers, student readiness is best supported for students with LFA in VLEs.

Essential Components of Exercise

The second research sub-question revealed teacher perspectives regarding the essential components of exercise among students with LFA who participate in VLEs. The data analysis showed that teachers valued student engagement and instruction by connecting students with instructional opportunities and routines and repetition as significant elements of student exercise. Thorndike's (1913) description of the law of exercise included teaching elements such as

repeated practice, practical application, exposure to positive stimulus-response pairings, drills, and repeating instructions (Anindyarini et al., 2018). In alignment with this theory, the data analysis revealed that teachers attributed special significance to differentiation of instruction, providing students with opportunities for repeated practice, short, concise instruction, routine-oriented scheduling, and being able to monitor student engagement.

The data suggests that teachers of students with LFA in VLEs routinely made efforts to capitalize on opportunities to provide their students with multi-modal, multi-sensory instruction. One teacher said this about strengthening student learning, "Obviously, that's done by demonstration . . . we expose them. We show them. We repeat it." The idea here is that teachers of students with LFA in VLEs seem to be keenly aware that to meet the needs of their students and effectively support student engagement, strategies needed to be implemented that capitalize on the students' abilities (such as the ability to see, hear, point, nod their head, etc.) while mitigating the adverse effects of their disability. In a sense, the results of the analysis alluded to the idea that the VLE is a sort of blank canvas with the potential to become a more effective method of instruction for students with LFA. This observation aligns with Averett's (2021) claim that virtual learning is uniquely positioned to be a more effective avenue for addressing anxiety-related maladaptive behaviors in education.

Hannah's comment further supports this idea of providing opportunities for students to connect with the instruction:

> And so we try to build on those activities that they really love and enjoy and add layers to those activities. So we might start with the song that they really love, and then we'll add some other prompts to the song or another skill on top of that. Then we might say let's do the other half of the song, or let's do it again.

Multi-modal instruction, as a contributor to connecting students with instructional opportunities, is one practical strategy that allows teachers and parents to provide opportunities for students to connect to the instruction, thereby increasing student engagement. Another highlighted strategy and contributing factor was the inclusion of multi-sensory integration in instruction. All teachers shared that they regularly added multi-sensory elements to their lessons to engage their students. Hannah shared, "So I have to incorporate music and dancing. Sometimes I'm sweating after I finish the session because if not, they're not participating." Multi-modal instruction primarily addresses student needs related to instructional access in the VLE, while multi-sensory instruction addresses student needs related to student engagement.

Sensory integration methods such as playing/singing songs, adding movement to instruction and structured breaks, using realia and manipulatives, adding visuals and animations to lessons, and others were identified as essential to supporting student engagement and access. This aligns with the suggestion by Khowaja et al. (2020) that VLEs should include multisensory elements to support student learning and increase generalization. The synchronizing of multimodal and multi-sensory elements in instruction is crucial to supporting learning for students with LFA in the VLE. When combined with other aspects of exercise that were identified by this study as significant elements of the teacher's experience (such as repetition and routines), VLEs have the potential to be utilized as computer-based interventions that will support habituation for students with LFA (Russell et al., 2019; Vélez-Coto et al., 2017). In doing so, this also suggests that VLEs can be uniquely designed to address student anxiety, which is one of the underlying causes of maladaptive behavior.

Essential Components of Effect

The third research sub-question revealed teacher perspectives regarding the essential components of effect among students with LFA in VLEs. The most significant element that teachers discussed as being integral to strengthening student learning through effect was providing the students with a learning environment and a learning experience in which student actions were appropriately reinforced, student anxiety was addressed before and throughout class lessons, and student interests were incorporated as a strategy to making learning enjoyable. These essential components of effect are also closely related to the central research question as both the central research question and sub-question three directly touched on elements of behaviorism.

In some ways, addressing the essential components of effect was a first step in the learning process. When asked about the most successful evidence-based strategies for learning and behavior modification, there was a consensus amongst the teachers regarding the importance of the frequent use of positive reinforcement, addressing student anxiety directly through behavioral modification strategies, social-emotional learning strategies (i.e., reminding of coping strategies and frequent breaks), and communication, and the importance of increasing student motivation to learn and engage by providing the students with a satisfying learning experience. As an essential component of effect, the data supports Skinner's (1965) theory of operant conditioning, suggesting that for students with LFA in the VLE, behaviors can be modified by, in part, consistently reinforcing appropriate student behavior and providing a rewards system or token economy for the students.

The essential elements of effect discovered in this study revealed that teachers in the VLE relied on strategies, such as routines and positive reinforcement, that would condition their students and support learning in the online environment. Strategies resembling a sort of operant

conditioning were regularly used by teachers to help students adjust to the VLE, teach students how to successfully navigate the VLE, and help students retain knowledge and accomplish lesson objectives in the VLE. In support of Skinner's (1965) theory, incorporating conditioning elements was essential to increasing success for students with LFA in the VLE. Hannah further illuminated the connection between teaching practices in the VLE and Skinner's theory when she said:

> I think that before ABA was a thing, we were implementing those strategies in the classroom . . . we were observing and understanding what leads to certain behaviors and then coming up with a solution so that we wouldn't get back to that behavior each time."

While some teachers did not admit to using ABA as a system of support in the classes, all teachers admitted to using strategies based on the theory from which ABA was derived (such as positive reinforcement).

To further demonstrate the value of conditioning in the VLE, Deborah stressed the importance of providing positive reinforcement to student behaviors when she touted it as one of the most successful evidence-based practices she uses when working with her students with LFA in the VLE. She stated that "being consistent with recognizing the positive behaviors all throughout the session" was a key practice that she used daily to support her students with LFA online. While this essential component was regarded as a staple element of the learning environment and experience for the students with LFA in the VLEs, the results of the data analysis revealed limitations in the teachers' ability to provide positive reinforcement to student behaviors.

For one, most teachers cited limitations in their ability to see and hear the students as the students often kept their cameras and mics turned off. This practice limited the number of

behaviors that teachers could reinforce and their ability to support the student in avoiding future behaviors. Elizabeth shared:

> We can't really do the ABCs of behavior because . . . we only see them for this amount of time and it was not like we see big blowouts. It'd be different if we could have them for larger periods of time and we could document on the behavior. We constantly reinforce behavior and if we're not redirecting, the only thing we see is if we don't catch it right away, it spirals.

Essentially, the data suggests that teachers must be able to actively monitor their students throughout the learning process (via camera, mic, parent report, and computer monitoring software) to provide timely and consistent positive reinforcement. This is essential to supporting student behavior in the VLE through positive behavioral supports (PBS).

In alignment with Skinner's (1965) theory, the development of positive behaviors was hindered due to an inability to provide the necessary supports online. When the teacher could not effectively monitor and interact with the student, and when the parents/caregivers did not provide the essential support, the students could not receive the reinforcements needed to increase desired behaviors and learning. As mentioned earlier, behaviors need to be addressed first before the students can be successful academically. A lack of training for parents and teachers/caregivers was also cited as a limitation to supporting appropriate student behaviors through positive behavioral supports.

This finding validates the claim by Nuske et al. (2019) that social, emotional, and self-regulatory supports, as well as other behavioral supports, can be challenging to provide without trained support staff. While limitations may have been revealed in positive reinforcements, the VLE presents a distinct opportunity for teachers to use technology to incorporate student

interests and provide a learning experience that creatively garners student buy-in. Teachers reported incorporating animations, videos, songs, dance, modeling and gestures, and other activities to create a more personalized and purposeful learning experience. This aligns with Zhao and Watterston's (2021) explanation of the post-pandemic educational gains in the VLE.

The data further supports the notion that increasing efforts to provide a satisfying learning experience may also provide a means by which teachers can effectively address anxiety-related issues. When describing an incident in which a student was experiencing anxiety, and she helped her to de-escalate by showing her cat, Ruth shared, "Find something that's unique to each of them. Find something that takes away from that (anxiety), even however briefly, and you stand a better chance at bringing them back." By combining the essential elements of cultivating a learning environment and experience in which the teacher and parent/caregiver appropriately reinforce student behaviors and by incorporating student interests and other educational elements to make learning enjoyable, teachers can support student learning and resilience (ability to overcome anxiety) for students with LFA in the VLE.

Implications for Policy or Practice

The findings of this study indicate that there is a significant need for training. Teachers collectively expressed a desire to be trained in methods that would allow them to support the students in the laws of learning (readiness, exercise, and effect). Findings also indicate that there is a need for parents/caregivers to be trained in providing positive behavioral supports using evidence-based practices (such as ABA) to mitigate student behaviors and support fruitful academic engagement in the VLE. Implications regarding policy and practice are explained in the next section and recommendations for policy and practice.

Implications for Policy

Policy implications for this study are informed by considerations of the data analysis and interpretation, prior research on the subject of the study, and teacher recommendations from the video journal prompt. The data suggests that many VLEs do not regularly provide relevant training to teachers of students with LFA. While some strategies may be gleaned from the training that is provided, the training itself is not specific to supporting the needs of students with LFA in VLEs. Some EBPs can be more easily transferred from the brick-and-mortar setting to the VLE. However, the novel nature of the VLE for students with LFA presents nuances that have not been addressed in previous research on EBPs. These nuances are significant enough to warrant policy adaptations to meet the needs of students with LFA in the online environment.

Implications for Policy on Teacher Training. One implication for policy involves schools implementing protocols to ensure that teachers of students with LFA who participate in the VLE receive relevant and specific (topical) training at the onset of the school year and throughout the school year. As a policy of many school districts, teachers are generally required to attend a series of trainings in preparation for the new school year. Some districts also require teachers to participate in various professional development meetings throughout the school year in which various areas of educational support are addressed. This study supported Stenhoff et al.'s findings that the teachers of students with LFA who attend school online are inadequately trained to support the needs of these students, despite attending various district-mandated trainings throughout the school year.

For this reason, school districts should implement protocols and policies that ensure that teachers of students with LFA who participate in VLEs receive training throughout the school year. The training should also address the specific areas of need mentioned in this study. Larraceleta et al. (2022) explained that teacher training should have as its purpose something that

for the teachers is insufficient. As it relates to this study, those areas include but are not limited to trainings on implementing PBS and using EBP to reinforce student behavior, trainings on how to effectively collaborate between teachers and caregivers/families of students with LFA, trainings on how to address abnormal sensory interests effectively, trainings on how to address social communication challenges effectively, trainings on how to effectively support students with hypo- and hyper-sensitivity, and trainings on how to address behavioral functions in the VLE. It should be noted that all suggested training should be relevant to supporting students with LFA in the VLE.

Implications for Policy on Parent Training. Another implication for policy addresses the need for parents to receive relevant training on effectively supporting their student with LFA in the VLE. This study's results revealed that teachers and students relied on the parents to provide a significant portion of the necessary support to ensure student success. Teachers relied on parents to provide the physical and proximity support students needed to connect with the instruction. Teachers also relied on the parents to provide essential positive behavioral supports and reinforcements to support behavior modification and to ensure that the students remain motivated and engaged in the instruction.

One of the issues revealed in this study was that parents unfamiliar with PBS and prompting hierarchies would sometimes experience frustration at not achieving a desired response from their student, or they would unintentionally cause their student to experience frustration and, in some cases, a complete meltdown. For these reasons, it is recommended that school districts adopt a policy and protocols to provide essential training to parents similar to those mentioned for teacher training. Districts may also benefit from creating policies that structure parent training as a step in enrollment. Either way, parents may benefit from being

provided with opportunities to receive training on how to use technology to support their student in accessing the learning environment, how to support student engagement within the VLE, how to implement PBS and reinforce student behaviors effectively, how to use prompting hierarchies to increase student independence in the VLE, and other relevant areas of need. Parents may also benefit from participating in the recommended training for teachers of students with LFA in the VLE.

Implications for Practice

It is clear that while VLEs present unique opportunities for students with LFA to excel in the learning environment, several adjustments should be made to increase its viability for these students. The following practice recommendations are intended to cultivate a robust learning environment in which the students are supported academically, physiologically, and behaviorally. The programs in which these students are enrolled in may benefit from incorporating strategies, activities, and guidelines that support and adhere to the essential components of readiness, exercise, and effect as this study outlines. Practical application may also include training teachers, parents, providers, and special education administrations on the essential components of readiness, exercise, and effect related to supporting students with LFA in the VLE. Training opportunities should refine the attendees' understanding of the unseen catalysts of challenging behaviors and disengagement and provide a more acute description of the support needed for students with LFA in the VLE. This recommendation aligns with the purpose of this study.

Empirical and Theoretical Implications

The findings in this study reveal several empirical and theoretical implications. An explanation of how this study’s results corroborate previous literature on this topic is provided.

Additionally, a description of how this study extends prior research is included. Implications for practice and future research are also provided.

Empirical Implications

Regarding empirical implications, this study corroborates previous research on the use of telehealth or virtual learning resources to address the behaviors of individuals with autism (ASD) as it relates to the educational setting. A study by Neely et al. (2021) supported the benefits of training caregivers to provide effective telehealth to clients. Although the authors were particularly interested in providing direct intervention to clients with ASD, the current study contributes an understanding of the feasibility and benefits of using VLEs to provide a sort of one-to-one behavioral intervention to the students. This may be accomplished by employing the trained parent/caregiver in the intervention as an extension of the teacher or therapist. Additionally, the findings in this study expound on the future implications presented by the Neely et al. (2021) study. Similar to the Neely et al. (2021) study, this study revealed that teachers face unique challenges regarding their ability to support the students by providing direct instruction. These findings corroborate previous literature by validating the need for interventions that do not require teachers and support providers to manipulate the physical environment or provide physical prompts.

Theoretical Implications

One theoretical implication for this study is directly related to Skinner's (1965) theory of operant conditioning and Deutsch and Deutsch's (1963), late selection theory. The results of this study outlined the significance of incorporating student interests and providing a satisfying learning experience to increase student engagement and support the student in overcoming the disabling effects of intense anxiety. The late selection theory describes how attention is a process

in which only the most pertinent sensory information is passed on for further cognitive processing. The theory of operant conditioning explains how strategically providing positive and negative reinforcement can support the modification of behaviors. In light of this, one theoretical implication may be seen when the two theories are complementary.

Specifically, the principles of Skinner's (1965) theory of operant conditioning (which are closely aligned with the essential components of Thorndike's law of effect as seen in the VLE) can be used in tandem with Deutsch and Deutsch's (1963) late selection theory to manipulate the nervous system and address some of the physiological and biochemical causes of challenging behavior among students with LFA. In other words, teachers of students with LFA in the VLE may be able to manufacture positive stimulus-response pairings by providing lots of reinforcement and a pleasant learning experience/environment to produce positive affect in situations that may have been previously associated with high anxiety. This also has implications for lessening the adverse effects of hypo- and hyper-sensitivity.

In addition to this, there are theoretical implications regarding Thorndike's (1913) laws of learning. This study highlighted several essential components that teachers of students with LFA in VLEs identified as crucial or significant to the learning process for these students. Although Thorndike describes the laws of learning as they relate to strengthening student success for a general student populous participating in what is assumed to be a traditional learning environment, the results of this study suggest that benefits may be had for students with LFA in VLEs. Implications for Thorndike's (1913) laws of learning indicate that benefits may be had in the areas of increased interactivity and collaboration with educators and parents, accessibility of instructional content, increased inclusion (by increasing active engagement alongside others),

and increased flexibility of instructional space and scheduling (Chowdhury et al., 2021; Gilson et al., 2020).

Limitations and Delimitations

Several limitations and delimitations were presented in this study. The limitations described in the next section are primarily related to participant demographics. While some limitations may be more impactful than others, they collectively present potential weaknesses in the study results. In addition, the delimitations of this study are explained, along with a rationale for limiting the scope of the study.

Limitations

Several limitations affected the outcome of the study. For one, all but one participant included in this study were female Special Education Teachers. Another limitation is seen in the participant's geographic locations. Seven out of 10 participants were from California. This was a significant limitation as each state has its own qualifications that teachers must meet to be certified to teach students with disabilities. Also, the credentialing requirements for teaching students with moderate-severe disabilities may differ depending on each state's requirements. At least two of the participants had a moderate-severe special education teaching credential. They taught students who had a diagnosis of autism but were preparing to enter college, along with teaching students who were non-verbal and dependent on their parent/caregiver for 100% of their daily tasks.

In addition to geographic location and gender, there were several no-shows and cancellations from participants. Because of this, several participants did not participate in the assigned focus group. Therefore, the analysis was limited to data from one focus group. This may have impacted the study by hindering the researcher from capturing some of the teacher's

perspectives as this data collection method intended. While the study was limited to data from one focus group, the information captured through the focus group reinforced the teacher's perspectives and experiences previously revealed through participant interviews and video journals.

Much of the discussion during the focus group entailed teachers restating comments they had previously made during their interview or journal prompt response and others agreeing to these re-expressed contributions. There was limited expounding on previous statements, and minimal new information was produced. Additionally, as seen in the data gleaned from the video journals, parent/caregiver and teacher training was the most frequently expressed theme. As a result of the consistency in which the themes and subthemes were revealed and reinforced across data collection methods, it is doubtful that the inclusion of data from a second focus group would have significantly impacted the themes and findings that were revealed in this study.

Delimitations

One delimitation was the minimum requirement of three years of teaching special education, which all participants were required to meet. This delimitation was added in the belief that participants with three or more years of special education teaching experience would have more to contribute to the study. The study was also delimited to teachers who taught grades sixth-12 and those currently teaching students online. This requirement did not allow consideration for the perspectives of teachers who previously taught online for three or more years but were not currently teaching online. The study results may have been limited by leaving out the experiences of those teachers who have recently returned to teaching in the brick-and-mortar classroom. Additionally, only Special Education Teachers who taught students with LFA were included in this study.

Recommendations for Future Research

In light of this study's findings and limitations, there are several recommendations for future research. Throughout the study, at least three teachers mentioned working for a non-public school (NPS) before working in the virtual learning environment. These teachers also shared that a vast majority (if not all) of the training that they received was specific to supporting students with LFA, which occurred during their time at the NPS. In this study, all of the teachers held current positions within the public school system. One recommendation is for future studies to explore how this phenomenon presents itself among teachers within the NPS. Another recommendation is for future studies to study how this phenomenon presents itself among elementary special education teachers of students with LFA in the VLE.

Additionally, it is recommended that future studies include a larger sample of special education teachers from more diverse geographic regions to increase the generalizability of the study results. Lastly, it is recommended that future studies include special education teachers who teach students with LFA within grades 6-12 in the brick-and-mortar classroom. This would allow for a comparison between the essential elements discovered in the VLE and those discovered in the brick-and-mortar classroom. A cross-comparison between how the essential elements of the laws of learning are presented in the VLE versus the brick-and-mortar classroom may yield valuable insights regarding best practices for selecting a school type and the most effective environments for supporting students with LFA and challenging behaviors.

Conclusion

This transcendental phenomenological study aimed to describe the perceptions of special education teachers regarding positive behavioral supports for students with low functioning autism (LFA) in virtual learning environments (VLEs). The research questions were designed to

explore teacher perspectives regarding Thorndike's laws of learning. Ten Special Education Teachers from across the United States participated in research in which their insights and experiences regarding positive behavioral supports for students with LFA within the VLE were shared through their focus group, interview, and video journal contributions.

By exploring the laws of readiness, exercise, and effect, themes were revealed in the areas of student preparedness and support, student engagement and instruction, learning environment and experience, and teacher and parent/caregiver training. Although only the interview questions were developed to explore the laws of learning, results of data synthesis from across all data collection methods revealed a strong connection between the themes and subthemes and the laws of learning. The study results indicated the essential components of each of the laws of learning and insights regarding the experiences of teachers who support students with LFA in the VLE.

The results indicated that training for teachers and parents on effectively supporting students with LFA in the VLE would benefit the educational programs and policies that support these students. Additionally, the results indicated that the essential elements of the laws of learning can be implemented within educational programs to mitigate some of the inhibiting effects of challenging behaviors and access to learning by capitalizing on student abilities and trained adult support. Overall, this study will add to the limited literature on students with LFA. It will serve as a change agent for teachers, parents, and educational institutions desiring to understand better and more effectively address the underlying factors of challenging behavior in a way that best supports 21st-century learners with LFA in the VLE.

References

Ala'i-Rosales, S., Cihon, J. H., Currier, T. D., Ferguson, J. L., Leaf, J. B., Leaf, R., ... & Weinkauf, S. M. (2019). The big four: Functional assessment research informs preventative behavior analysis. *Behavior Analysis in Practice, 12,* 222-234.

Alase, A. (2017). The interpretative phenomenological analysis (IPA): A guide to a good qualitative research approach. *International Journal of Education and Literacy Studies, 5*(2), 9-19.

Alcañiz Raya, M., Chicchi Giglioli, I. A., Marín-Morales, J., Higuera-Trujillo, J. L., Olmos, E., Minissi, M. E., Teruel Garcia, G., Sirera, M., & Abad, L. (2020). Application of supervised machine learning for behavioral biomarkers of autism spectrum disorder based on electrodermal activity and virtual reality. Frontiers in Human Neuroscience, 14, 90-90. https://doi.org/10.3389/fnhum.2020.00090

Almarzooq, Z. I., Lopes, M., & Kochar, A. (2020). Virtual learning during the COVID-19 pandemic: a disruptive technology in graduate medical education. *Journal of the American College of Cardiology, 75*(20), 2635-2638.

Alvares, G. A., Bebbington, K., Cleary, D., Evans, K., Glasson, E. J., Maybery, M. T., Pillar, S., Uljarević, M., Varcin, K., Wray, J., & Whitehouse, A. J. (2020). The misnomer of 'high functioning autism': Intelligence is an imprecise predictor of functional abilities at diagnosis. *Autism : The International Journal of Research and Practice, 24*(1), 221-232. https://doi.org/10.1177/1362361319852831

Amankwaa, L. (2016). Creating protocols for trustworthiness in qualitative research. *Journal of cultural diversity*, *23*(3).

American Psychiatric Association. (2022). *Diagnostic and statistical manual of mental disorders, text revision* (5th ed.) https://doi.org/10.1176/appi.books.9780890425787

Anders, A. (2013). Foucault and 'the Right to Life': from Technologies of Normalization to Societies of Control". *Disability Studies Quarterly*, *33*(3). https://dsq-sds.org/article/view/3340/3268

Anindyarini, A., Rokhman, F., & Mulyani, M. (2018). Behavioristic theory and its application in the learning of speech. KnE Social Sciences, 522-530. Arifin, S. R. M. (2018). Ethical considerations in qualitative study. *International Journal of Care Scholars*, *1*(2), 30-33.

Arifin, S. R. M. (2018). Ethical considerations in qualitative study. *International journal of care scholars*, *1*(2), 30-33.

Ausderau, K., Sideris, J., Furlong, M., Little, L. M., Bulluck, J., & Baranek, G. T. (2014). National survey of sensory features in children with ASD: Factor structure of the sensory experience questionnaire (3.0). *Journal of autism and developmental disorders*, *44*(4), 915-925

Autism Speaks. (2022, June 26). *Autism diagnosis criteria*. Autism Speaks. https://www.autismspeaks.org/autism-diagnosis-criteria-dsm-5

Averett, K. H. (2021). Remote learning, COVID-19, and children with disabilities. *AERA Open*, *7*, 23328584211058471. https://journals.sagepub.com/doi/pdf/10.1177/23328584211058471

Bąbel, P. (2020). Operant conditioning as a new mechanism of placebo effects. European Journal of Pain, 24(5), 902-908. https://doi.org/10.1002/ejp.1544

Baker, A. E., Lane, A., Angley, M. T., & Young, R. L. (2008). The relationship between sensory processing patterns and behavioural responsiveness in autistic disorder: A pilot study. *Journal of autism and developmental disorders*, *38*, 867-875.

Bal, V. H., Farmer, C., & Thurm, A. (2017). Describing function in ASD: Using the DSM-V and other methods to improve precision. Journal of Autism and Developmental Disorders, 47(9), 2938-2941. https://doi.org/10.1007/s10803-017-3204-3

Bartholomew, T. T., Joy, E. E., Kang, E., & Brown, J. (2021). A choir or cacophony? sample sizes and quality of conveying participants' voices in phenomenological research. *Methodological Innovations, 14*(2), 205979912110400. https://doi.org/10.1177/20597991211040063

Bijlenga, D., Tjon-Ka-Jie, J. Y. M., Schuijers, F., & Kooij, J. J. S. (2017). Atypical sensory profiles as core features of adult ADHD, irrespective of autistic symptoms. *European Psychiatry*, *43*, 51-57.

Blackstone, A. (2014). Principles of sociological inquiry qualitative and quantitative methods. Saylor Foundation. Retrieved May 12 2023 from http://poznam.mnz.sigov.si/skmp/images/abook_file/sociology_researchmethods.pdf.

Bloomfield, J., & Fisher, M. J. (2019). Quantitative research design. *JARNA : The Official Journal of the Australasian Rehabilitation Nurses' Association, 22*(2), 27-30. https://doi.org/10.33235/jarna.22.2.27-30

Bouck, E. C., Park, J., & Stenzel, K. (2020). Virtual manipulatives as assistive technology to support students with disabilities with mathematics. Preventing School Failure, 64(4), 281-289. https://doi.org/10.1080/1045988X.2020.1762157

Bradbury-Jones, C., Sambrook, S., & Irvine, F. (2009). The phenomenological focus group: An oxymoron? *Journal of Advanced Nursing, 65*(3), 663-671. https://doi.org/10.1111/j.1365-2648.2008.04922.x

Briggs, A. M., Akers, J. S., Greer, B. D., Fisher, W. W., & Retzlaff, B. J. (2018). Systematic changes in preference for schedule-thinning arrangements as a function of relative reinforcement density. *Behavior Modification*, *42*(4), 472-497. https://journals.sagepub.com/doi/abs/10.1177/0145445517742883

Bujnakova, I., Ondrejka, I., Mestanik, M., Visnovcova, Z., Mestanikova, A., Hrtanek, I., Fleskova, D., Calkovska, A., & Tonhajzerova, I. (2016). Autism spectrum disorder is associated with autonomic underarousal. Physiological Research, S673-S682. https://doi.org/10.33549/physiolres.933528

Burghardt, M. (2011). The human bottom of non-human things: On critical theory and its contributions to critical disability studies. *Critical Disability Discourses*.

Campbell, S., Greenwood, M., Prior, S., Shearer, T., Walkem, K., Young, S., Bywaters, D., & Walker, K. (2020). Purposive sampling: complex or simple? Research case examples. *Journal of Research in Nursing*, *25*(8), 652-661.

Carr, D. (1977). Kant, husserl, and the nonempirical ego. *The Journal of Philosophy*, *74*(11), 682-690. https://doi.org/10.2307/2025771

Carr, E. G. (1994). Emerging themes in the functional analysis of problem behavior. *Journal of Applied Behavior Analysis*, *27*(2), 393-399.

Chakrabarti, B. (2017). Commentary: Critical considerations for studying low-functioning autism. Journal of Child Psychology and Psychiatry, 58(4), 436-438. https://doi.org/10.1111/jcpp.12720

Chowdhury, M., Demir, I., Jiang, J., & Shahzad, N. (2021). Will Highschool Students after the Pandemic Want a System of Education to Be a Hybrid of Remote Learning and in Person Learning. *Across the Spectrum of Socioeconomics*, *1*, 252-273.

Chyung, S. Y., & Vachon, M. (2013). An investigation of the profiles of satisfying and dissatisfying factors in E-learning. *Performance Improvement Quarterly*, *26*(2), 117-140. https://doi.org/10.1002/piq.21147

Cohen, I. L., & Flory, M. J. (2019). Autism spectrum disorder decision tree subgroups predict adaptive behavior and autism severity trajectories in children with ASD. Journal of Autism and Developmental Disorders, 49(4), 1423-1437. https://doi.org/10.1007/s10803-018-3830-4

Crespi, B., Stead, P., & Elliot, M. (2010). Comparative genomics of autism and schizophrenia. *Proceedings of the National Academy of Sciences*, *107*(suppl_1), 1736-1741.

Creswell, J., & Poth, C. (2018). Qualitative inquiry and research design: Choosing among five approaches. Sage.

Crişan, H. T., & Copoeru, I. (2020). Illness and two meanings of phenomenology. *Journal of Evaluation in Clinical Practice, 26*(2), 425-430. https://doi.org/10.1111/jep.13350

de Giambattista, C., Ventura, P., Trerotoli, P., Margari, M., Palumbi, R., & Margari, L. (2018). Subtyping the autism spectrum disorder: Comparison of children with high functioning autism and asperger syndrome. Journal of Autism and Developmental Disorders, 49(1), 138-150. https://doi.org/10.1007/s10803-018-3689-4

Dellapiazza, F., Michelon, C., Oreve, M., Robel, L., Schoenberger, M., Chatel, C., Vesperini, S., Maffre, T., Schmidt, R., Blanc, N., Vernhet, C., Picot, M., & Baghdadli, A. (2020). The

impact of atypical sensory processing on adaptive functioning and maladaptive behaviors in autism spectrum disorder during childhood: Results from the ELENA cohort. *Journal of Autism and Developmental Disorders, 50*(6), 2142-2152. https://doi.org/10.1007/s10803-019-03970-w

Denzin, N. K., & Lincoln, Y. S. (2011). *The Sage handbook of qualitative research*. sage.

Deutsch, J. A., & Deutsch, D. (1963). Attention: Some theoretical considerations. *Psychological review, 70*(1), 80.

de Villiers, C., Farooq, M. B., & Molinari, M. (2021). Qualitative research interviews using online video technology–challenges and opportunities. *Meditari Accountancy Research*.

Dominick, K. C., Davis, N. O., Lainhart, J., Tager-Flusberg, H., & Folstein, S. (2007). Atypical behaviors in children with autism and children with a history of language impairment. *Research in developmental disabilities, 28*(2), 145-162.

D'Souza, K. (2023). The pandemic fueled a public school exodus, study says. *EdSource. Published online February 10*. https://edsource.org/2023/the-pandemic-fueled-a-public-school-exodus-study-says/685555

Dukes, S. (1984). Phenomenological methodology in the human sciences. *Journal of religion and health, 23*(3), 197-203.

Eldh, A. C., Rycroft-Malone, J., Zijpp, T., McMullan, C., & Hawkes, C. (2020). Using nonparticipant observation as a method to understand implementation context in Evidence-Based practice. *Worldviews on Evidence-Based Nursing, 17*(3), 185-192. https://doi.org/10.1111/wvn.12449Fombonne, E. (2018). Editorial: The rising prevalence of autism. Journal of Child Psychology and Psychiatry, 59(7), 717-720. https://doi.org/10.1111/jcpp.12941

Fennel, B., & Dillenburger, K. (2018). Applied behaviour analysis and autism: Science, profession, and practice. *Behavior analysis*, 9-21.

Ferguson, J., Craig, E. A., & Dounavi, K. (2019). Telehealth as a model for providing behaviour analytic interventions to individuals with autism spectrum disorder: A systematic review. *Journal of autism and developmental disorders*, *49*, 582-616.

Fernández-Batanero, J. M., Cabero-Almenara, J., Román-Graván, P., & Palacios-Rodríguez, A. (2022). Knowledge of university teachers on the use of digital resources to assist people with disabilities. The case of Spain. *Education and Information Technologies*, *27*(7), 9015-9029.

Fombonne, E. (2018). The rising prevalence of autism. *Journal of Child Psychology and Psychiatry*, *59*(7), 717-720.

Freina, L., Bottino, R., & Tavella, M. (2016). From e-learning to VR-learning: an example of learning in an immersive virtual world. Journal of e-learning and knowledge society, 12(2).

Fulton, E., Eapen, V., Črnčec, R., Walter, A., & Rogers, S. (2014). Reducing maladaptive behaviors in preschool-aged children with autism spectrum disorder using the Early Start Denver Model. *Frontiers in pediatrics*, *2*, 40.

Galef, B. G. (1998). Edward Thorndike: Revolutionary psychologist, ambiguous biologist. *The American Psychologist*, *53*(10), 1128-1134. https://doi.org/10.1037/0003-066X.53.10.1128

Gibson, R. B. (2020). Elective impairment minus elective disability: The social model of disability and body integrity identity disorder. *Journal of Bioethical Inquiry*, *17*(1), 145-155. https://doi.org/10.1007/s11673-019-09959-5

Gilson, C. B., Gushanas, C. M., Li, Y. F., & Foster, K. (2020). Defining inclusion: Faculty and student attitudes regarding postsecondary education for students with intellectual and developmental disabilities. *Intellectual and Developmental Disabilities, 58*(1), 65-81.

Giorgi, A. P., & Aanstoos, C. M. (1985). Phenomenology and psychological research. *(No Title)*.

Given, L. M. (2008). *The SAGE encyclopedia of qualitative research methods* (Vols. 1-0). Thousand Oaks, CA: SAGE Publications, Inc. doi: 10.4135/9781412963909

Griffin, Z. A., Boulton, K. A., Thapa, R., DeMayo, M. M., Ambarchi, Z., Thomas, E., Pokorski, I, Hickie, I.B., & Guastella, A. J. (2022). Atypical sensory processing features in children with autism, and their relationships with maladaptive behaviors and caregiver strain. *Autism Research, 15*(6), 1120-1129. https://onlinelibrary.wiley.com/doi/full/10.1002/aur.2700

Grynszpan, O., Weiss, P. L., Perez-Diaz, F., & Gal, E. (2014). Innovative technology-based interventions for autism spectrum disorders: A meta-analysis. Autism: The International Journal of Research and Practice, 18(4), 346-361. https://doi.org/10.1177/1362361313476767

Hanesty, E., Neviyarni, N., & Karneli, Y. (2020). Factors affecting student learning motivation during the Covid-19 pandemic. *International Journal of Applied Counseling and Social Sciences, 2*(1), 100-107. http://download.garuda.kemdikbud.go.id/article.php?article=2345610&val=22610&title=Factors%20Affecting%20Student%20Learning%20Motivation%20During%20the%20Covid-19%20Pandemic

Harris, J. (2018). Leo Kanner and autism: a 75-year perspective. *International review of psychiatry*, *30*(1), 3-17.

Harvey, P. D., Deckler, E., Jones, M. T., Jarskog, L. F., Penn, D. L., & Pinkham, A. E. (2019). Autism symptoms, depression, and active social avoidance in schizophrenia: Association with self-reports and informant assessments of everyday functioning. *Journal of psychiatric research*, *115*, 36-42.

Hewitt, M. (2022). How does a foucauldian genealogical approach enhance the study of long-term care through a critical disability lens? *Societies (Basel, Switzerland)*, *12*(3), 73. https://doi.org/10.3390/soc12030073

Hong, E., & Matson, J. L. (2021). An evaluation of the functions of challenging behavior in toddlers with and without autism spectrum disorder. *Journal of Developmental and Physical Disabilities*, *33*(1), 85-97. https://doi.org/10.1007/s10882-020-09734-0

Hoogenhout, M., & Malcolm-Smith, S. (2017). Theory of mind predicts severity level in autism. *Autism*, *21*(2), 242-252.

Hurwitz, S., Garman-McClaine, B., & Carlock, K. (2022). Special education for students with autism during the COVID-19 pandemic: "Each day brings new challenges". *Autism: The International Journal of Research and Practice*, *26*(4), 889-899. https://doi.org/10.1177/13623613211035935

Husserl, E. (1970). *Logical Investigations Volume 1* (J. Findlay, Trans). Routledge. (Original work published 1901) https://philarchive.org/archive/HUSLIV

Individuals with Disabilities Education Act, 20 U.S.C. § 1401 (2004). https://sites.ed.gov/idea/regs/b/a/300.5

Islam, M. H. (2015). Thorndike theory and it's application in learning. *At-Ta'lim: Jurnal Pendidikan*, *1*(1), 37-47. https://ejournal.inzah.ac.id/index.php/attalim/article/view/166

Ivanović, I. (2021). Psychiatric comorbidities in children with ASD: Autism centre experience. *Frontiers in Psychiatry, 12*, 673169-673169. https://doi.org/10.3389/fpsyt.2021.673169

Jackson, C., Vaughan, D. R., & Brown, L. (2018). Discovering lived experiences through descriptive phenomenology. *International Journal of Contemporary Hospitality Management, 30*(11), 3309-3325. https://doi.org/10.1108/IJCHM-10-2017-0707

Jiujias, M., Kelley, E., & Hall, L. (2017). Restricted, repetitive behaviors in autism spectrum disorder and obsessive–compulsive disorder: A comparative review. *Child Psychiatry & Human Development*, *48*, 944-959.

Kallio, H., Pietilä, A., Johnson, M., & Kangasniemi, M. (2016). Systematic methodological review: Developing a framework for a qualitative semi-structured interview guide. *Journal of Advanced Nursing, 72*(12), 2954-2965. https://doi.org/10.1111/jan.13031

Kenny, L., Hattersley, C., Molins, B., Buckley, C., Povey, C., & Pellicano, E. (2016). Which terms should be used to describe autism? Perspectives from the UK autism community. *Autism, 20*(4), 442-462.

Khlaisang, J., & Songkram, N. (2019). Designing a virtual learning environment system for teaching twenty-first century skills to higher education students in ASEAN. *Technology, Knowledge and Learning*, *24*, 41-63. https://link.springer.com/article/10.1007/s10758-017-9310-7

Khowaja, K., Salim, S. S., Asemi, A., Ghulamani, S., & Shah, A. (2020). A systematic review of modalities in computer-based interventions (CBIs) for language comprehension and

decoding skills of children with autism spectrum disorder (ASD). *Universal Access in the Information Society*, *19*(2), 213-243.

Kim, S. K. (2015). Recent update of autism spectrum disorders. *Korean journal of pediatrics*, *58*(1), 8.

Kimble-Hill, A. C., Rivera-Figueroa, A., Chan, B. C., Lawal, W. A., Gonzalez, S., Adams, M. R., Heard, G., Gazley, J., & Fiore-Walker, B. (2020). Insights gained into marginalized students access challenges during the COVID-19 academic response. *Journal of Chemical Education*, *97*(9), 3391-3395.

Knight, V. F., Huber, H. B., Kuntz, E. M., Carter, E. W., & Juarez, A. P. (2019). Instructional practices, priorities, and preparedness for educating students with autism and intellectual disability. *Focus on Autism and Other Developmental Disabilities*, *34*(1), 3-14.

Kozleski, E. B. (2017). The uses of qualitative research: Powerful methods to inform evidence-based practice in education. *Research and Practice for Persons with Severe Disabilities, 42*(1), 19-32. https://doi.org/10.1177/1540796916683710

Krueger, R. A., & Casey, M. A. (2000). *Focus groups: A practical guide for applied research*. Thousand Oaks, Calif: Sage Publications.

Laffey, J., Schmidt, M., Stichter, J., Schmidt, C., & Goggins, S. (2009). iSocial: A 3D VLE for Youth with Autism. Stolz, S. A. (2020). Phenomenology and phenomenography in educational research: A critique. *Educational Philosophy and Theory*, *52*(10), 1077-1096. https://doi.org/10.1080/00131857.2020.1724088

Lake, J. K., Tablon Modica, P., Chan, V., & Weiss, J. A. (2020). *Considering efficacy and effectiveness trials of cognitive behavioral therapy among youth with autism: A systematic review*. SAGE Publications. https://doi.org/10.1177/1362361320918754

Lambert, S. D., & Loiselle, C. G. (2008). Combining individual interviews and focus groups to enhance data richness. *Journal of advanced nursing*, *62*(2), 228-237.

Larraceleta, A., Castejón, L., Iglesias-García, M. T., & Núñez, J. C. (2022). Assessment of public special education teachers training needs on evidence-based practice for students with autism spectrum disorders in Spain. *Children*, *9*(1), 83.

Leko, M. M., Cook, B. G., & Cook, L. (2021). Qualitative methods in special education research. *Learning Disabilities Research and Practice, 36*(4), 278-286. https://doi.org/10.1111/ldrp.12268

Lidstone, J., Uljarević, M., Sullivan, J., Rodgers, J., McConachie, H., Freeston, M., Le Couteur, A., Prior, M., & Leekam, S. (2014). Relations among restricted and repetitive behaviors, anxiety and sensory features in children with autism spectrum disorders. *Research in Autism Spectrum Disorders, 8*(2), 82-92. https://doi.org/10.1016/j.rasd.2013.10.001

Lincoln, Y., & Guba, E. (1985). *Naturalistic inquiry.* Sage.

Lindor, E., Sivaratnam, C., May, T., Stefanac, N., Howells, K., & Rinehart, N. (2019). Problem behavior in autism spectrum disorder: considering core symptom severity and accompanying sleep disturbance. *Frontiers in psychiatry*, *10*, 487. https://www.frontiersin.org/articles/10.3389/fpsyt.2019.00487/full

Liu, Y., Zhao, L., & Su, Y. S. (2022). The impact of teacher competence in online teaching on perceived online learning outcomes during the COVID-19 outbreak: A moderated-mediation model of teacher resilience and age. *International Journal of Environmental Research and Public Health*, *19*(10), 6282. https://www.mdpi.com/1660-4601/19/10/6282

Lord, C., Elsabbagh, M., Baird, G., & Veenstra-Vanderweele, J. (2018). Autism spectrum disorder. *The Lancet (British Edition), 392*(10146), 508-520. https://doi.org/10.1016/S0140-6736(18)31129-2

Lugo-Marín, J., Magán-Maganto, M., Rivero-Santana, A., Cuellar-Pompa, L., Alviani, M., Jenaro-Rio, C., Díez, E., & Canal-Bedia, R. (2019). Prevalence of psychiatric disorders in adults with autism spectrum disorder: A systematic review and meta-analysis. *Research in Autism Spectrum Disorders, 59,* 22-33. https://doi.org/10.1016/j.rasd.2018.12.004

Lydon, S., Healy, O., Reed, P., Mulhern, T., Hughes, B. M., & Goodwin, M. S. (2016). A systematic review of physiological reactivity to stimuli in autism. *Developmental Neurorehabilitation, 19*(6), 335-355. https://doi.org/10.3109/17518423.2014.971975

Maenner, M. J., Shaw, K. A., Baio, J., Washington, A., Patrick, M., DiRienzo, M., Christensen, D.L., Wiggins, L.D., Pettygrove, S., Andrews, J.G., Lopez, M., Huson, A., Baroud, T., Schwenk, Y., White, T., Rosenberg, C.R., Lee, L.C., Harrington, R.A., Huston, M., … & Dietz, P. M. (2020). Prevalence of autism spectrum disorder among children aged 8 years—autism and developmental disabilities monitoring network, 11 sites, United States, 2016. *MMWR Surveillance summaries, 69*(4), 1. https://www.cdc.gov/mmwr/volumes/65/ss/ss6503a1.htm?scid=ss6503a1w

Manzano, A. (2016). The craft of interviewing in realist evaluation. *Evaluation (London, England. 1995), 22*(3), 342-360. https://doi.org/10.1177/1356389016638615

Mardiyanti, M. (2016). Strategies for Successful Transition into Mainstream Schools for Young Children with Autism Spectrum Disorders: A Case Study. *Nurse Media Journal of Nursing*, *6*(1), 1-8. https://ejournal.undip.ac.id/index.php/medianers/article/view/11815

Marino, F., Chilà, P., Failla, C., Crimi, I., Minutoli, R., Puglisi, A., Arnao, A., Tartarisco, G., Ruta, L., Vagni, D., & Pioggia, G. (2020). Tele-assisted behavioral intervention for families with children with autism spectrum disorders: A randomized control trial. *Brain Sciences, 10*(9), 649.

Marotta, R., Risoleo, M. C., Messina, G., Parisi, L., Carotenuto, M., Vetri, L., & Roccella, M. (2020). The neurochemistry of autism. *Brain Sciences, 10*(3), 163. https://doi.org/10.3390/brainsci10030163

Marshall, C., & Rossman, G. B. (2014). *Designing qualitative research*. Sage publications.

Masi, A., DeMayo, M. M., Glozier, N., & Guastella, A. J. (2017). An overview of autism spectrum disorder, heterogeneity and treatment options. *Neuroscience Bulletin, 33*(2), 183-193. https://doi.org/10.1007/s12264-017-0100-y

Mazurek, M. O., Lu, F., Macklin, E. A., & Handen, B. L. (2019). Factors associated with DSM-V severity level ratings for autism spectrum disorder. *Autism : The International Journal of Research and Practice, 23*(2), 468-476. https://doi.org/10.1177/1362361318755318

McCormick, C., Hepburn, S., Young, G. S., & Rogers, S. J. (2016). Sensory symptoms in children with autism spectrum disorder, other developmental disorders and typical development: A longitudinal study. *Autism : The International Journal of Research and Practice, 20*(5), 572-579. https://doi.org/10.1177/1362361315599755

McGaha, K. K., & D'Urso, P. A. (2019). A non-traditional validation tool: Using cultural domain analysis for interpretive phenomenology. *International Journal of Social Research Methodology, 22*(6), 585-598. https://doi.org/10.1080/13645579.2019.1621474

Merriam-Webster. (n.d.). Reliability. In *Merriam-Webster.com dictionary*. Retrieved November 1, 2021, from https://www.merriam-webster.com/dictionary/reliability

Merriam-Webster. (n.d.). Virtual. In *Merriam-Webster.com dictionary*. Retrieved September 16, 2022, from https://www.merriam-webster.com/dictionary/virtual

Mertens, D. M. (2007). Transformative paradigm: Mixed methods and social justice. *Journal of Mixed Methods Research, 1*(3), 212-225. https://doi.org/10.1177/1558689807302811

Mertens, D. M. (2017). Transformative research: personal and societal. *International Journal for Transformative Research, 4*(1), 18-24. https://sciendo.com/pdf/10.1515/ijtr-2017-0001

Miller, C. J., Barnett, M. L., Baumann, A. A., Gutner, C. A., & Wiltsey-Stirman, S. (2021). The FRAME-IS: A framework for documenting modifications to implementation strategies in healthcare. *Implementation Science : IS, 16*(1), 36-36. https://doi.org/10.1186/s13012-021-01105-3

Miller, R. R., & Polack, C. W. (2018). Sources of maladaptive behavior in 'normal' organisms. *Behavioural Processes, 154*, 4-12. https://doi.org/10.1016/j.beproc.2017.12.017

Moustakas, C. (1994). Phenomenological research methods. Sage.

Murphy, G., Groeger, J. A., & Greene, C. M. (2016). Twenty years of load theory—Where are we now, and where should we go next? *Psychonomic bulletin & review*, *23*(5), 1316-1340. Skinner, B. F. (1965). *Science and human behavior*. Simon and Schuster. https://tinyurl.com/w2df9rbj

Nagai, Y., Hinobayashi, T., & Kanazawa, T. (2017). Influence of early social-communication behaviors on maladaptive behaviors in children with autism spectrum disorders and intellectual disability. *Journal of Special Education Research, 6*(1), 1-9. https://doi.org/10.6033/specialeducation.6.1

Nah, Y., & Tan, J. W. (2021). The effect of diagnostic labels on teachers' perceptions of behaviours of students with autism spectrum disorder. *British Journal of Educational Psychology, 91*(1), 315-327. https://doi.org/10.1111/bjep.12368

Nakajima, M., Schmitt, L. I., Feng, G., & Halassa, M. M. (2019). Combinatorial targeting of distributed forebrain networks reverses noise hypersensitivity in a model of autism spectrum disorder. *Neuron, 104*(3), 488-500.

National Center for Education Statistics (NCES) home page, part of the U.S. Department of Education. National Center for Education Statistics (NCES) Home Page, a part of the U.S. Department of Education. (n.d.). https://nces.ed.gov/

Neely, L., MacNaul, H., Gregori, E., & Cantrell, K. (2021). Effects of telehealth-mediated behavioral assessments and interventions on client outcomes: A quality review. Journal of Applied Behavior Analysis, 54(2), 484-510. https://onlinelibrary.wiley.com/doi/abs/10.1002/jaba.818

Newcomb, E. T., & Hagopian, L. P. (2018). Treatment of severe problem behaviour in children with autism spectrum disorder and intellectual disabilities. *International Review of Psychiatry, 30*(1), 96-109.

Nguyen, A. O., Binder, D. K., Ethell, I. M., & Razak, K. A. (2020). Abnormal development of auditory responses in the inferior colliculus of a mouse model of fragile X syndrome. *Journal of Neurophysiology, 123*(6), 2101-2121. https://doi.org/10.1152/jn.00706.2019

Nieto, C., López, B., & Gandía, H. (2017). Relationships between atypical sensory processing patterns, maladaptive behaviour and maternal stress in spanish children with autism spectrum disorder: Sensory processing, maladaptive behaviour and maternal

stress. *Journal of Intellectual Disability Research, 61*(12), 1140-1150. https://doi.org/10.1111/jir.12435

Nikolić, M. (2020). Disturbed social information processing as a mechanism in the development of social anxiety disorder. *Child Development Perspectives, 14*(4), 258-264. https://srcd.onlinelibrary.wiley.com/doi/full/10.1111/cdep.12390

Nuske, H. J., McGhee Hassrick, E., Bronstein, B., Hauptman, L., Aponte, C., Levato, L., Stahmer, A., Mandell, D., Mundy, P., Kasari, C., & Smith, T. (2019). Broken bridges—new school transitions for students with autism spectrum disorder: A systematic review on difficulties and strategies for success. *Autism, 23*(2), 306-325.

Oxford University Press. (2024). Success. In *Oxford English dictionary*. Retrieved April 15, 2024.

Pennefather, J., Hieneman, M., Raulston, T. J., & Caraway, N. (2018). Evaluation of an online training program to improve family routines, parental well-being, and the behavior of children with autism. *Research in Autism Spectrum Disorders, 54*, 21-26. https://www.sciencedirect.com/science/article/abs/pii/S175094671830093X

Phungsuk, R., Viriyavejakul, C., & Ratanaolarn, T. (2017). Development of a problem-based learning model via a virtual learning environment. *Kasetsart Journal of Social Sciences, 38*(3), 297-306.

Pollard, J. S., LeBlanc, L. A., Griffin, C. A., & Baker, J. M. (2021). The effects of transition to technician-delivered telehealth ABA treatment during the COVID-19 crisis: A preliminary analysis. *Journal of applied behavior analysis, 54*(1), 87-102.

Pritchard, D., English, A. R., & Ravenscroft, J. (2021). Extended cognition, assistive technology and education. *Synthese (Dordrecht), 199*(3-4), 8355-8377. https://doi.org/10.1007/s11229-021-03166-9

Rattaz, C., Michelon, C., Munir, K., & Baghdadli, A. (2018). Challenging behaviours at early adulthood in autism spectrum disorders: Topography, risk factors and evolution. *Journal of Intellectual Disability Research, 62*(7), 637-649. https://doi.org/10.1111/jir.12503

Roberts, B. (2018). Recasting odysseus: Embodied sensemaking among seafaring leaders. *Australian Journal of Maritime and Ocean Affairs, 10*(1), 19-34. https://doi.org/10.1080/18366503.2017.1355953

Roberts, B. (2019). Husserl's epoché and the way of the sword: Exploring pathways into phenomenological inquiry. *Qualitative Research Journal, 19*(4), 391-402. https://doi.org/10.1108/QRJ-02-2019-0022

Rogers, S. J., & Ozonoff, S. (2005). Annotation: What do we know about sensory dysfunction in autism? A critical review of the empirical evidence. *Journal of Child Psychology and Psychiatry, 46*(12), 1255-1268.

Romani, P. W., Luehring, M. C., Hays, T. M., & Boorse, A. L. (2023). Comparisons of functional behavior assessment procedures to the functional analysis of problem behavior. *Behavior Analysis: Research and Practice, 23*(1), 36.

Rosen, T. E., Connell, J. E., & Kerns, C. M. (2016). A review of behavioral interventions for anxiety-related behaviors in lower-functioning individuals with autism. *Behavioral Interventions, 31*(2), 120-143.

Rosenberg, R. E., Daniels, A. M., Law, J. K., Law, P. A., & Kaufmann, W. E. (2009). Trends in autism spectrum disorder diagnoses: 1994–2007. *Journal of autism and developmental disorders*, *39*, 1099-1111.

Rosli, M. I., Embi, Z., Abdullah, J., Samsudin, M. A., Zainal Abidin, M. I., & Abdullah, N. (2021). Reaction and learning evaluation of a non-immersive virtual reality application for children with autism spectrum disorder [version 1; peer review: Awaiting peer review]. *F1000 Research, 10*, 1020. https://doi.org/10.12688/f1000research.73386.1

Russell, G., Mandy, W., Elliott, D., White, R., Pittwood, T., & Ford, T. (2019). Selection bias on intellectual ability in autism research: A cross-sectional review and meta-analysis. *Molecular Autism, 10*(1), 9-9. https://doi.org/10.1186/s13229-019-0260-x

Ryan, E., & Poole, C. (2019). Impact of virtual learning environment on students' satisfaction, engagement, recall, and retention. *Journal of Medical Imaging and Radiation Sciences, 50*(3), 408-415. https://doi.org/10.1016/j.jmir.2019.04.005

Sandman, C. A., Barron, J. L., Chicz-DeMet, A., & DeMet, E. M. (1991). Brief report: plasma beta-endorphin and cortisol levels in autistic patients. *Journal of autism and developmental disorders*, *21*(1), 83-87. https://escholarship.org/content/qt4655w9qd/qt4655w9qd.pdf

Sangrà, A., Vlachopoulos, D., & Cabrera, N. (2012). Building an inclusive definition of e-learning: An approach to the conceptual framework. *International Review of Research in Open and Distributed Learning, 13*(2), 145-159.

Schuck, R. K., & Lambert, R. (2020). "Am I doing enough?" Special educators' experiences with emergency remote teaching in Spring 2020. *Education Sciences, 10*(11), 320.

Schulz, S. E., & Stevenson, R. A. (2019). Sensory hypersensitivity predicts repetitive behaviours in autistic and typically-developing children. *Autism : The International Journal of Research and Practice, 23*(4), 1028-1041. https://doi.org/10.1177/1362361318774559

Sharma, S., Hucker, A., Matthews, T., Grohmann, D., & Laws, K. R. (2021). Cognitive behavioural therapy for anxiety in children and young people on the autism spectrum: a systematic review and meta-analysis. *Bmc Psychology, 9*(1), 1-16. https://bmcpsychology.biomedcentral.com/articles/10.1186/s40359-021-00658-8

Shire, S. Y., Baker Worthman, L., Shih, W., & Kasari, C. (2020). Comparison of face-to-face and remote support for interventionists learning to deliver JASPER intervention with children who have autism. *Journal of Behavioral Education, 29*, 317-338.

Shurr, J., Bouck, E. C., Bassette, L., & Park, J. (2021). Virtual versus concrete: A comparison of mathematics manipulatives for three elementary students with autism. *Focus on Autism and Other Developmental Disabilities, 36*(2), 71-82.

Skinner, B. F. (1965). *Science and human behavior*. Simon and Schuster. https://tinyurl.com/ac9frvjf

Stedman, A., Taylor, B., Erard, M., Peura, C., & Siegel, M. (2018). Are children severely affected by autism spectrum disorder underrepresented in treatment studies? an analysis of the literature. *Journal of Autism and Developmental Disorders, 49*(4), 1378-1390. https://doi.org/10.1007/s10803-018-3844-y

Stenhoff, D. M., Pennington, R. C., & Tapp, M. C. (2020). Distance education support for students with autism spectrum disorder and complex needs during covid-19 and school closures. *Rural Special Education Quarterly, 39*(4), 211-219. https://journals.sagepub.com/doi/full/10.1177/8756870520959658

Stichter, J. P., Laffey, J., Galyen, K., & Herzog, M. (2014). iSocial: Delivering the social competence intervention for adolescents (SCI-A) in a 3D virtual learning environment for youth with high functioning autism. *Journal of autism and developmental disorders*, 44, 417-430. https://link.springer.com/article/10.1007/s10803-013-1881-0

Sutton, J., & Austin, Z. (2015). Qualitative research: Data collection, analysis, and management. *Canadian Journal of Hospital Pharmacy*, *68*(3), 226-231. https://doi.org/10.4212/cjhp.v68i3.1456

Then, K. L., Rankin, J. A., & Ali, E. (2014). Focus group research: What is it and how can it be used? Canadian Journal of Cardiovascular Nursing, 24(1), 16-22.

Thorndike, E. L. (1913). *The psychology of learning* (Vol. 2). Teachers College, Columbia University. https://play.google.com/books/reader?id=zLkBAAAAYAAJ&pg=GBS.PP6&hl=en

Tomaino, M. A. E., Greenberg, A. L., Kagawa-Purohit, S. A., Doering, S. A., & Miguel, E. S. (2022). An assessment of the feasibility and effectiveness of distance learning for students with severe developmental disabilities and high behavioral needs. *Behavior analysis in practice, 15*(1), 243-259. https://link.springer.com/article/10.1007/s40617-020-00549-1

Tomaszewski, L. E., Zarestky, J., & Gonzalez, E. (2020). Planning qualitative research: Design and decision making for new researchers. *International Journal of Qualitative Methods, 19*https://doi.org/10.1177/1609406920967174

Tomlinson, S. (1997). Edward lee thorndike and john dewey on the science of education. *Oxford Review of Education, 23*(3), 365-383. https://doi.org/10.1080/0305498970230307

Tremain, S. (2001). On the government of disability. *Social theory and practice*, *27*(4), 617-636.

Tsikinas, S., & Xinogalos, S. (2019). Studying the effects of computer serious games on people with intellectual disabilities or autism spectrum disorder: A systematic literature review. *Journal of Computer Assisted Learning*, *35*(1), 61-73.

Tunney, J., & Hanreddy, A. (2021). Inclusive teaching requires inclusive lesson planning. In *Minding the Marginalized Students Through Inclusion, Justice, and Hope: Daring to Transform Educational Inequities* (pp. 111-134). Emerald Publishing Limited.

Valencia, K., Rusu, C., Quiñones, D., & Jamet, E. (2019). The impact of technology on people with autism spectrum disorder: a systematic literature review. Sensors, 19(20), 4485. https://www.mdpi.com/1424-8220/19/20/4485

Van Manen, M. (1990). Researching lived experience: Human science for an action sensitive pedagogy. State University

Vélez-Coto, M., Rodríguez-Fórtiz, M. J., Rodriguez-Almendros, M. L., Cabrera-Cuevas, M., Rodríguez-Domínguez, C., Ruiz-López, T., Burgos-Pulido, Á., Garrido-Jiménez, & Martos-Pérez, J. (2017). SIGUEME: Technology-based intervention for low-functioning autism to train skills to work with visual signifiers and concepts. *Research in developmental disabilities*, *64*, 25-36.

Wang, X., & Xing, W. (2022). Supporting youth with autism learning social competence: A comparison of game-and nongame-based activities in 3D virtual world. *Journal of educational computing research*, *60*(1), 74-103.of New York Press. https://journals.sagepub.com/doi/abs/10.1177/07356331211022003

Wattanawongwan, S., Ganz, J. B., Pierson, L. M., Yllades, V., Liao, C., & Ura, S. K. (2022). Communication intervention implementation via telepractice parent coaching: Child

outcomes and correlations. *Journal of Special Education Technology, 37*(1), 100-111. https://doi.org/10.1177/0162643420962007

Willis, D. J., & Fensterwald, J. (2021). Over half of California public school students remain in distance learning. *EdSource. Published online May, 5*.

Wiltsey Stirman, S., Baumann, A. A., & Miller, C. J. (2019). The FRAME: An expanded framework for reporting adaptations and modifications to evidence-based interventions. *Implementation Science : IS, 14*(1), 58-58. https://doi.org/10.1186/s13012-019-0898-y

Woo, C. C., Donnelly, J. H., Steinberg-Epstein, R., & Leon, M. (2015). Environmental enrichment as a therapy for autism: A clinical trial replication and extension. *Behavioral neuroscience, 129*(4), 412.

Yuan, S. N. V., & Ip, H. H. S. (2018). Using virtual reality to train emotional and social skills in children with autism spectrum disorder. *London journal of primary care, 10*(4), 110-112. https://www.tandfonline.com/doi/full/10.1080/17571472.2018.1483000

Zhang, H., Nurius, P., Sefidgar, Y., Morris, M., Balasubramanian, S., Brown, J., Dey, Anind K, Kuehn, K., Riskin, E., & Mankoff, J. (2020). How does COVID-19 impact students with disabilities/health concerns?. *arXiv preprint arXiv:2005.05438*.

Zhang, L., Weitlauf, A. S., Amat, A. Z., Swanson, A., Warren, Z. E., & Sarkar, N. (2020). Assessing social communication and collaboration in autism spectrum disorder using intelligent collaborative virtual environments. *Journal of autism and developmental disorders, 50*, 199-211. https://link.springer.com/article/10.1007/s10803-019-04246-z

Zhao, Y., & Watterston, J. (2021). The changes we need: Education post COVID-19. *Journal of Educational Change, 22*(1), 3-12. https://link.springer.com/article/10.1007/s10833-021-09417-3?trk=public_post_main-feed-card_feed-article-content

Appendix A: IRB Approval

LIBERTY UNIVERSITY.
INSTITUTIONAL REVIEW BOARD

October 25, 2023

Alicia Davis
Sherrita Rogers

Re: IRB Exemption - IRB-FY23-24-347 A Phenomenological Study Of The Perceptions Of Behavioral Supports For Students With Low Functioning Autism In Virtual Learning Programs

Dear Alicia Davis, Sherrita Rogers,

The Liberty University Institutional Review Board (IRB) has reviewed your application in accordance with the Office for Human Research Protections (OHRP) and Food and Drug Administration (FDA) regulations and finds your study to be exempt from further IRB review. This means you may begin your research with the data safeguarding methods mentioned in your approved application, and no further IRB oversight is required.

Your study falls under the following exemption category, which identifies specific situations in which human participants research is exempt from the policy set forth in 45 CFR 46:104(d):

Category 2.(iii). Research that only includes interactions involving educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observation of public behavior (including visual or auditory recording) if at least one of the following criteria is met:
The information obtained is recorded by the investigator in such a manner that the identity of the human subjects can readily be ascertained, directly or through identifiers linked to the subjects, and an IRB conducts a limited IRB review to make the determination required by §46.111(a)(7).

For a PDF of your exemption letter, click on your study number in the My Studies card on your Cayuse dashboard. Next, click the Submissions bar beside the Study Details bar on the Study details page. Finally, click Initial under Submission Type and choose the Letters tab toward the bottom of the Submission Details page. Your information sheet and final versions of your study documents can also be found on the same page under the Attachments tab.

Please note that this exemption only applies to your current research application, and any modifications to your protocol must be reported to the Liberty University IRB for verification of continued exemption status. You may report these changes by completing a modification submission through your Cayuse IRB account.

If you have any questions about this exemption or need assistance in determining whether possible modifications to your protocol would change your exemption status, please email us at irb@liberty.edu.

Sincerely,

[redacted]

Appendix B: Informed Consent Form

CONSENT FORM

A Phenomenological Study Of The Perceptions Of Behavioral Supports For Students With Low Functioning Autism In Virtual Learning Programs

Alicia Chamberlin
Liberty University
School of Education

You are invited to participate in a qualitative research study on the experiences of Special Education Teachers who support students with Autism Spectrum Disorder (ASD) and challenging behavior in virtual learning environments. You were selected as a possible participant because you are a Special Education Teacher who has taught online for a minimum of three years and who supports at least one student with ASD.

Alicia Chamberlin, a doctoral candidate in the School of Education at Liberty University, is the researcher conducting this study.

Study Purpose: The purpose of this study is to explore the lived experiences of Special Education Teachers regarding supports that are available for students with ASD and behavioral challenges who attend school online. Your valuable insights as a Special Education Teacher will contribute significantly to the findings and the advancement of knowledge in this field.

Voluntary Nature of the Study: Participation in this study is entirely voluntary, and you have the right to withdraw your consent or discontinue your involvement at any time without penalty or negative consequences. Your decision to participate or decline will not affect your current or future relationship with your employer or Liberty University. All information that you provide during the study will be treated with strict confidentiality and will be used for research purposes only.

Study Procedures:
If you choose to participate, the following procedures will take place:

1. Informed Consent Process: Prior to the study, I will contact you to discuss the study's purpose, procedures, potential benefits, and any potential risks or discomforts associated with participation. You will have the opportunity to ask questions and clarify any concerns you may have.
2. Demographic Survey: Participants will complete a brief Demographic Survey via a Google Form that should take no more than 20 minutes.
3. Interview Sessions: I will conduct one individual semi-structured interview with you, lasting approximately 40 minutes via a video conferencing system. The interviews will be audio-video recorded to ensure accurate data collection.
4. Focus Groups: I will facilitate a focus group discussion involving you and four to seven other participants. Focus group sessions will also be conducted via a video conferencing

system and last approximately 40 minutes. Focus group discussions will be audio-video recorded.

5. Video Journal: You will be asked to individually answer a journal prompt including four questions. Journal prompt data collection will be conducted via a video conferencing system and audio video recorded for transcription and analysis. This activity will last approximately 15 minutes. You have the option to turn your camera off or keep it on for all recorded video conferencing sessions (interview, focus group, and video journal).
6. After all videos have been transcribed you will be asked to read the transcriptions for accuracy. This will last approximately 25 minutes.

Data Analysis: The recorded interviews will be transcribed verbatim, and the data will be analyzed for themes and patterns. The findings will be used for research purposes, potentially including academic publications, presentations, or reports. However, your identity and personal information will remain confidential and will not be disclosed.

Confidentiality: Your participation and the information you provide will be kept strictly confidential. Only the researcher will have access to the data. To ensure anonymity, any personal identifiers will be removed and pseudonyms will be used in any publications or reports resulting from the study. For the recorded video-conferencing sessions (interview, focus group, and video journal), you are encouraged to attend the data collection sessions in a quiet private room in your home. Additionally, all recordings will be stored on a password-protected personal computer in my home office, and any identifying details will be removed during the transcription process to maintain anonymity. Names and other identifying information will be collected as part of this study, but participant identities will not be disclosed.

Benefits: While direct benefits cannot be guaranteed, your participation in this study will also contribute to the knowledge and understanding of socially valid research for a marginalized population in Special Education, you will have increased knowledge regarding effective supports for students with ASD and challenging behaviors at the outcome of the study, and you will have the opportunity to indirectly contribute to research that will potentially inform efficacious evidence-based practices (EBP) and future professional development opportunities for Special Education Teachers.

Compensation: Direct benefits include being entered into a drawing whereby 3 participants will be randomly selected to receive 1 of either a $75, $50, or $25 Amazon e-gift card.

Risks: There are minimal anticipated risks associated with participation, such as potential emotional discomfort when discussing certain topics. However, you are free to skip any questions or topics that you find uncomfortable.

Researcher Contact: Please feel free to contact me at [redacted] f you have any questions, concerns, or if you require further clarification about the study. You may also contact my faculty advisor, Dr. Sherrita Rogers at [redacted]. At your request, a copy of this consent letter will be provided to you for your records.

If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher or her faculty advisor, you may contact the Institutional Review Board at irb@liberty.edu.
By signing this consent letter, you indicate that you understand the study's procedures, potential risks and benefits, and the voluntary nature of your participation. You also acknowledge that you have had the opportunity to ask questions and have received satisfactory answers to your inquiries.

Statement of Consent: I have read and understood the information provided above. I have had the opportunity to ask questions and receive answers. I voluntarily consent to participate in the qualitative study described.

☐ The researcher has my permission to audio-video record me as part of my participation in this study.

Participant's Signature: _____ Date:_____
Researcher's Signature: _____ Date:_____

Thank you for considering participation in this study. Your contribution is invaluable and greatly appreciated.
Sincerely,
Alicia Chamberlin
Researcher and Doctoral Candidate
Liberty University School of Education

Appendix C: Demographic Survey

1. Gender:
    a. Male
    b. Female
2. Age:
    a. 18-24 years old
    b. 25-34 years old
    c. 35-44 years old
    d. 45-54 years old
    e. 55-64 years old
    f. 65 years or older
3. Ethnicity:
    a. White
    b. Black or African American
    c. Asian
    d. Hispanic or Latino
    e. Native American or American Indian
    f. Other (please specify): _____
4. Educational background:
    a. Bachelor's degree
    b. Master's degree
    c. Doctoral degree
5. Teaching experience in Special Education:
    a. 1-5 years
    b. 6-10 years
    c. 11-15 years
    d. 16-20 years
    e. More than 20 years
6. Grade level(s) currently teaching in Special Education (Select all that apply):
    a. Middle School (Grades 6-8)
    b. High School (Grades 9-12)
    c. Transition Services (Ages 18-21)
    d. Other (please specify): _____
7. Specific disabilities or special needs areas supported (Select all that apply):
    a. Autism Spectrum Disorder (ASD)
    b. Intellectual Disabilities
    c. Learning Disabilities
    d. Emotional and Behavioral Disorders
    e. Speech and Language Impairments
    f. Sensory Impairments (Hearing or Vision)
    g. Physical Disabilities
    h. Other (please specify): _____
8. Specific Autism Spectrum Disorder (ASD) levels supported (Select all that apply):
    a. Level 1 ASD (Traditionally High Functioning)
    b. Level 2 ASD

   c. Level 3 ASD (Traditionally Low Functioning)
   d. None of the above. I do not support students with ASD.
9. Type of instruction provided:
   a. Online
   b. In-person
   c. Blended (online and in person)
   d. Other (please specify): _____
10. Geographic location (State):
   a. (Specific State):_____
11. Please provide your contact information:
   a. Email:_____
   b. Phone:_____

Thank you for taking the time to complete this survey. Your participation is greatly appreciated, and your valuable insights will contribute to the success of this study.

Appendix D: Interview Protocol

1. Please describe your educational background and career through your current position. CRQ and SQ3
2. According to the Laws of Learning by Edward Thorndike (1913), there are several observable elements that indicate or support student readiness in the class environment. Some of these elements include having lesson/task learning objectives that are clearly articulated, students demonstrating an interest in completing lessons/tasks, task/lesson purpose is clearly articulated (i.e., reward or benefit), making an effort to reduce outside worries or hindrances (i.e., calming strategies), and making an effort to physically or mentally prepare students for task/lesson. When working with students with LFA in your online class what components of readiness do you observe? How often is the component observed (less than, about, or greater than 5 days per week)? SQ1
3. What symptoms of anxiety are most frequently demonstrated among the students with LFA in your online classes? SQ1
4. Describe the behavioral and learning challenges that are experienced when working with students experiencing anxiety LFA in your online classes. SQ1
5. Describe the practices you use when working with students with LFA who experience anxiety in your online classes. SQ1
6. What signs of physical or mental unpreparedness are most frequently exhibited among the students with LFA in your online classes? SQ1
7. Describe the behavioral and learning challenges that are experienced when working with students with LFA who demonstrate signs of physical or mental unpreparedness in your online classes. SQ1

8. Describe the practices you use when working with students with LFA who demonstrate signs of mental or physical unpreparedness in your online classes. SQ1
9. According to the Laws of Learning by Edward Thorndike (1913), there are several observable elements that indicate or support student exercise in the class environment. Some of these elements include learning that is strengthened by repeated practice or exposure to positive stimulus-response pairings, recall, review, restatement, drills, and practical application. When working with students with LFA in your online class what components of exercise do you observe? How often is the component observed (less than, about, or greater than 5 days per week).? SQ2
10. What characteristics of hyposensitivity are most frequently demonstrated among the students with LFA in your online classes? SQ2
11. Describe the behavioral and learning challenges that are experienced when working with students with hyposensitivity and LFA in your online classes. SQ2
12. Describe the practices you use when working with students with hyposensitivity and LFA in your online classes. SQ2
13. What characteristics of hypersensitivity are most frequently demonstrated among the students with LFA in your online classes? SQ2
14. Describe the behavioral and learning challenges that are experienced when working with students with hypersensitivity and LFA in your online classes. SQ2
15. Describe the practices you use when working with students with hypersensitivity and LFA in your online classes. SQ2
16. According to the Laws of Learning by Edward Thorndike (1913), there are several observable elements that indicate or support student effect in the class environment.

Some of these elements include reinforcing appropriate student behavior by providing pleasant consequences, reinforcing unpleasant student behavior by removing unpleasant consequences, student learning is strengthened by providing a satisfying experience, and student learning is strengthened by providing a reward. When working with students with LFA in your online class what components of effect do you observe? How often is the component observed (less than, about, or greater than 5 days per week)? SQ3

17. What learning challenges related to LFA do you observe when working with students with LFA in your online classes? CRQ, SQ1, SQ2, and SQ3
18. What types of RRBs do you observe when working with students with LFA in your online class? CRQ, SQ1, SQ2, and SQ3
19. What maladaptive behaviors do you observe when working with students with LFA in your online classes? CRQ, SQ1, SQ2, and SQ3
20. How are EBPs for learning and behavior modification (such as ABA) implemented for students with LFA within your online class? CRQ and SQ3
    a. How are appropriate behavior and learning reinforced or rewarded among students with LFA in your online class? CRQ and SQ3
21. Describe the most successful EBP or ABA strategies you use when working with students with LFA in your online classes. CRQ and SQ3
    a. What are some of the responses that students with LFA present when these strategies are implemented? CRQ and SQ3
22. What else would you like to add to our discussion regarding your experiences with students with LFA that we haven't discussed? CRQ, SQ1, SQ2, and SQ3

Appendix E: Sample Interview Transcript

Speaker 1 0:04
OK so.
The recording has started, so thank you for then you understand.
Speak today.
So I'll be interviewing [redacted] and this is the interview protocol on January 30th 2024.
Again, the recording has started.
We are being transcribed.
We'll first go over the interview questions and answer those, and then we will umm, I introduced the video journal prompt for you to answer on your own.

Speaker 1 0:38
OK.

Speaker 2 0:40
OK, so starting with the interview protocol question number one, can you please just share a your educational background and career through to your current position?

Speaker 1 0:54
Umm, so I went to [redacted] where I got my teaching credential and moderate to severe.
What working with students with moderate to severe special needs, umm.
And then after that I became.
Sorry I became a an aide of sorts, like a behavior aid at a school that was primarily for students with very.
Very.
Disruptive behaviors and UM and then from there I became a teacher at that same school and I worked there for 10 years.
Umm do you need me to state the name of the school, [redacted] or no?

Speaker 1 1:41
No.

Speaker 2 1:41
No.
OK, cool.
And I worked there for 10 years as a teacher and then after that I went to a public school district and I worked there for a year and now I am primarily working online with a virtual school.

Speaker 1 2:02
OK.
Thank you very much.

Speaker 2 2:03
Did I answer all of it?
[redacted]

Alicia. OK.

Speaker 1 2:05
Yes, ma'am.
Yes, ma'am.
Perfect.
Thank you for that.
OK, so our this interview, like I said, there's 21 primary question.
And so it's going to be divided up into three sections, so to speak.
The first section we're going, the questions are based on a law, a lot of learning and that's called the law of readiness and the law of readiness.

Speaker 2 2:20
The.

Speaker 1 2:31
Some examples of a lot of readiness are.
Well, first of all, the love readiness is our the signs that a student shows or practices that new implement to help a student be ready for learning to take place.
And So what that might look like is making an effort to reduce outside worries or hindrances like reminding of calming strategies that might look like making an effort to physically or mentally prepare the students for a task, making sure they have breakfast, reminding him of, you know, the past lesson.

Speaker 2 3:02
Umm.
Yeah.

Speaker 1 3:14
Umm.
OK, so those are some examples when working with students with a with autism in your class low functioning autism.

Speaker 2 3:18
Umm.

Speaker 1 3:24
And that's autism with intellectual disability typically.
So when working with students with LFA that's local autism and your class, what components are readiness?
Do you observe and how often do you observe them?

Speaker 2 3:41
[redacted] may answering this space on the current classroom that I'm in like.

Speaker 1 3:46

Yeah.

Speaker 2 3:48
OK.
Umm I I do see a lot of like front loading like front loading the students to make sure that they know what's coming up and what's expected of them.
So there's also within that a lot of like repetition of the expectations, which I feel helps them become ready to learn.
And then, umm, let's see.
What else do we do?
Ah, we also try to avoid having distractions by, like, controlling the chat distraction and making sure that, like tools are being used appropriately so that everybody can learn and feel comfortable.
And then.
Yeah.
In previous classrooms, we had like a calming room.
We kept distractions to a minimum in that room, so when I was in a brick and mortar school.

Speaker 1 4:45
Umm.
OK.
And then how often do you observe these?
Elements of readiness.
Is it daily, like every day of the week?
Most days of the week, one day a week.

Speaker 2 5:05
I would say that we, I I see front loading at least daily, I would say with our students.
I feel that that's super important for them to know what's going on and what's coming up just for to keep those anxiety levels low during the learning process.
So I see that pretty much every day. Umm.
Keeping the distractions down, umm, I feel that that that happens pretty much daily as well and we we try to you know just disable the tool or remind them to use the tools in an expected way.
Let's see.
I feel that we could maybe remind them to take breaks more baby, something that I used to do, that I'd like to do more.
They're feeling frustrated, but other than that, that's what I see more consistently.

Speaker 1 6:01
OK.
OK.
Thank you.
And then see question #3 what symptoms of a anxiety are are do you see most among the students with autism and in your class, what symptoms of anxiety?

Speaker 2 6:23

I just I guess I see a lot more of like them just wanting to know what's happening, what's going on?
How do they do it?
And it kind of just needs to be explained in a very like, concrete black and white sort of way.
Ohh to get them to kind of understand how to do that.
So the anxiety I feel that they have is more so on on how to how to actually do things.
Umm, so that's when I see their anxiety level go up as if that's not clear, I suppose.

Speaker 1 6:49
Umm.
And they're more of that questioning.

Speaker 2 7:02
What?

Speaker 1 7:03
Uh, so sorry about that, that loud.
Trying so you it sounds like you're saying they ask a lot of questions.

Speaker 2 7:12
Yeah.
So I'm asking questions raising their hand.
In class sometimes.

Speaker 1 7:23
OK.

Speaker 2 7:23
Times I'm muting their mic without.
Without without asking but.

Speaker 1 7:31
Umm OK. Thank you.
And then question #4.
Uh.
Describe the behavioral and learning challenges that are experience when working with students who are also experiencing anxiety and have autism.

Speaker 2 7:50
Come describe the problems.
Is that what she said, [redacted]?

Speaker 1 7:54
The behavioral and learning challenges that.

Speaker 2 7:57

The challenge?

Speaker 1 7:58
Mm-hmm.

Speaker 2 8:00
Umm, they would see like maybe them feeding off of each other.

Speaker 1 8:00
When the students in.

Speaker 2 8:05
Umm.
So maybe one student might start to have anxiety over something, and my verbalize that and other students might follow.
So that can be a challenge.

Speaker 1 8:21
OK.
Umm, thank you.
And then question #5.
Describe the practices that you use when working with students with a low functioning autism who experience anxiety.

Speaker 2 8:42
Umm so I tried to use like little like built in breaks throughout lessons to make sure that they have various ways that they can interact or various ways to express themselves.
So sometimes the brakes can be related to the lesson, sometimes they might just be a fun break.
And then I like to definitely front load my students with like the schedule and what's the objective and what we're gonna do prior and then?
Umm yeah, I keep losing my train of thought.

Speaker 1 9:19
I thought I thought that that's OK. That's OK.

Speaker 2 9:20
And I'm sorry.

Speaker 1 9:24
Great.
No, this is good information.
I'm seeing a theme here, so that's good.
OK.
Question #6 what signs of physical or mental unpreparedness?
Umm.
Are most frequently exhibited among the students with autism in your class.

So we're looking at physical or mental unpreparedness.
What does that look like from the students who have autism in your class?

Speaker 2 9:54
Gum.
Local and untold unpreparedness.
I'm so maybe they're not just them, just not engaging or not being ready to like, verbalize, or communicate or express themselves in whichever way that they do.
Umm, so I see that a lot and then let's see mental physical preparedness.
I I guess when they show up late, I don't know if that's like when they show up late and they're like, I'm here.
I'm sorry.

Speaker 1 10:31
OK, OK.

Speaker 2 10:32
Because they do that sometimes.

Speaker 1 10:36
OK, perfect.
And then this is the last question for this section.
Umm well actually we have two more.
Ohh, describe the behavioral and learning challenges that.
Our experience, one working OK, so let me let me summarize that one.
What are some of the behavioral and learning challenges that you observe when the students are, umm, showing these signs of physical or mental unpreparedness and it kind of you kind of answered it in your last one.
Umm.
Behavioral learning challenges no engagement.
UM, never.

Speaker 2 11:16
Yeah.
So there's like three.
Yeah, lack of engagement.
And then or or, they might start talking about something else in the chat instead of whatever we're doing.
Umm, sometimes they will literally have their camera on and look like they're sleep.
I've seen that.
Yeah, yeah.

Speaker 1 11:40
OK.

All right, pick and then the last question for this section describe the practices that you use for working with these students who are demonstrating signs of mental or physical unpreparedness in your class.

Speaker 2 12:00
I'm gonna try to offer more, more assistance, so I'll reach out umm through email or however I can to the parent or the the caregiver to try to help the situation, especially if the student is more nonverbal or not able to express himself as well.
And I I also like to front load my students and make sure that they are prepared.
So that might be like going over something that they might be worried about in case let's support our small group sessions.
Umm.
So sometimes I'll do like a lesson on something that I I see a lot in chat, that they're they look concerned about ohm or they're having or I notice that they're having difficulty with.

Speaker 1 12:47
OK.

Speaker 2 12:47
So there's that.

Speaker 1 12:49
OK.
Speaker 1 12:49
OK.
Great.
Thank you.
OK, so question #9.
So the next law, the next set of questions, will be related to another law called the Law of Exercise and.
With the law of exercise, this is umm, these deal with practices that will be implemented to.
Uh.
Strengthen learning so things like repeated practice exposure to positive stimulus and response pairings.
For example, you have like a math assignment and you you have an Avenger Avengers Avengers theme to math assignment, so it's a positive stimulus with a with that with that assignment, so that those sorts of pairings recalling information, reviewing information, restating instruction and other information, drill work and practical application.

Speaker 2 13:40
Umm.

Speaker 1 13:55
Like if we do like a couple class or something like that.

Speaker 2 13:59

OK.

Speaker 1 13:59
So that's a lot of exercise.
What elements of this law do you observe in your class and how often?

Speaker 2 14:10
Repeated practice for sure.
We do that a lot.
We remind our students of the expectations and.
Do some of our lessons multiple times a review them at later dates.
So I see that pretty much at least weekly, if not daily, and.
I know in my class I like to try to use a lot of positive stimulus, so I do like to I usually I did it with my other group, but I usually at the beginning of the year we'll send out like a survey where they put all like their favorite things and I try to like, aim my lessons toward that.
Fortunately, I did not do it once I was moved to this group, so that'll be something.
Maybe to try this semester, but yeah, I do like to try to aim my lessons at maybe something if I can tie something that they enjoy in that's always been something that I've enjoyed doing and I see that also in class when we teach quite regularly pretty much weekly, especially on like the fun Fridays and stuff we'll tie in.
Some of their their things that they've been wondering or thinking about, which is kind of cool.
I think we also do a lot of like review with our cahoots on a weekly basis, so we'll review like material with them like short fun game quizzes or even like little games in the unique learning system program that we use, they'll have like little games where they'll have to, like, pick words out of a board that go together kind of like a connection sort of thing.
If you play that game on newyorktimes.com.
It's like a categories game.
It's fun, but yeah, just like little review type games and strategies to try to review the information.
And then just trying to keep the information like short and concise and to the point and what they need.
Umm yeah.

Speaker 1 16:23
OK.
OK, great.
OK, very good question 10.
What?
OK, so this is talking about hyposensitivity.
So what characteristics of Hyposensitivity are most frequently demonstrated by the students with autism your class?
So there's hyposensitivity and there's hypersensitivity.
Umm, hyper sensitivity looks like.
I'm a student getting overstimulated by sensory input.
Maybe wearing?

Speaker 2 17:00
Yes, I have those.

Speaker 1 17:02
Headphone it's kind of thing.
Headphones.

Speaker 2 17:04
Yeah.

Speaker 1 17:04
Umm, so we're talking about Hyposensitivity first.
So what?

Speaker 2 17:09
OK.

Speaker 1 17:10
What characteristics of Hyposensitivity needing pressure standing far away from the computer and things like that?

Speaker 2 17:18
OK.

Speaker 1 17:19
Or or nothing far away, standing too close.

Speaker 2 17:23
Umm.
Let's see.
I I honestly, [redacted] I see more hyper.
I feel like in in in my past and and from what I've seen and actually experienced a see more hyper as far as hype.

Speaker 1 17:31
OK.

Speaker 2 17:40
So I I have had students that do need to like pulled something or have something on them like a pressure thing.
I have seen that used in our classes.
Umm, when kids turn on like a camera because we are more more online virtual.
So it's a little more difficult to see some of that stuff.
Umm, but many of our kids just don't put on their camera, so it's a little hard to see some of that in the setting that we're in.

Speaker 1 18:14
OK.
OK, umm and fair enough.
And OK, so question #11.
So what are the behavioral or can you describe some of the behavioral and learning challenges that are experienced when working with students who are hyposensitive?
I know you said it's kind of difficult to see, but you didn't mention some students have to hold something.
Umm do you see any behavioral or learning challenges?

Speaker 2 18:41
Yeah.

Speaker 1 18:44
Where among students who are hyposensitive.

Speaker 2 18:48
I mean.
I don't.
I don't know.
At Lisa, I mean maybe like I feel like sometimes maybe they're not.
They they need things and maybe explained more more in, in, in more, in more ways sometimes.
But I'm.
I'm not.
I'm not sure how to answer that question.

Speaker 1 19:13
OK, no worries.
Umm OK question #12, what are some of the practices that you use when working with students with hyposensitivity?

Speaker 2 19:29
So in the past I have had students that do need you know, the pressure, the pressure items and so they have used those in the past in my classrooms.
So those are some of the things that I've used.
Yeah, I'm just drawing a blank on this one.

Speaker 1 19:48
OK, OK.

Speaker 2 19:49
You the hypothesis.

Speaker 1 19:50
Yeah, with the online environment, I know that there are some of the things are transferable within some art.

So if if you're like, I don't know about the online, I don't see, I don't see anything then that's OK.

Speaker 2 20:02
OK.

Speaker 1 20:03
OK.
Let's see.
Let's go to 13.
OK, so now we're on to hypersensitivity.
So in your online class, what characteristics of hypersensitivity are most frequently demonstrated among your students with autism?

Speaker 2 20:12
But.
So I would just say like them getting overwhelmed by like the chat.
Or if like if like, there's too much going on in the chat, they might like.
Disengage.
Sometimes also like during when we show like videos with certain things in it.
Like if we have a video that has like an animal in it or something that a student might be sensitive towards.
OK, I've seen students disengage then.

Speaker 1 20:57
OK.
And what does that look like?

Speaker 2 21:01
Home, just like them not being responsive or if their visual if I can see them on the camera sometimes I'll see them get up.
Walk away.
I'm from the area.
Or they'll like stand and they'll like pace or or sway side to side.
Umm, there there is one student.
I believe that does hold something like hold it, but that would be hypo, wouldn't it?
I don't know.
I'm getting myself confused.

Speaker 1 21:30
That's OK, that's OK.
OK.
No, I have that.
That's good.
That's good.
OK, 14 describe the behavioral and learning challenges that are experienced when working with students with hypersensitivity.

Speaker 2 21:48
I would say it's just have to make sure that you're being.
You're not providing too much all at once.
So really like making sure that you've.
Paired things down or chunked things in a way that that are visually easy to look at or easy to read or learn.
So I've used like chunking where we've like taken ohh wait, have you asked about strategies yet?
I don't know.

Speaker 1 22:21
That's actually my next question.

Speaker 2 22:23
OK.

Speaker 1 22:23
So describe the practices that you use when working with those with hypersensitivity.

Speaker 2 22:29
Umm, so if you seems like chunking just like like using simple like snipping tools to like take things and blow it up and make it bigger and just focus on one area of something in our curriculum.
So I do that quite often. Umm.
Also feel that the kiddos with hypersensitive sensitivity do need that front loading and that visual schedule to kind of know like what's gonna happen.
Umm, just so that they're aware and then?
Sorry, I'm tired, [redacted]

Speaker 1 23:09
OK.

Speaker 2 23:10
I like thinking.
What else?
Yeah, just trying not to throw too much at them at once, really.

Speaker 1 23:19
OK.
And.
Umm, OK, great.
And then?
OK.
So we're going to move on to the next section and this is the last section.
Let me switch over here.
OK.

So you talked about the log readiness, the log exercise and now we are going into the law of effect and with the law of effect.
What this looks like?
These are ways to reinforce appropriate student behavior by doing things like providing pleasant. Consequences and reinforcing unpleasant student behavior by removing unpleasant consequences.
Uh.
Providing a satisfying learning experience.
See providing a reward like a token economy.
What are some elements of effect that you observe in your classroom and how often?

Speaker 2 24:32
Umm, so I would say that there is a lot of like positive praise that does go on in our classroom as far as like when the students are are doing well.
And then there's also some ignoring of like the negative behavior.
Umm.
If there's any of that or quick small redirections and then umm.
And then we usually do like like a like a fun Friday at the end of the week where the kids get to to share and stuff like that.
So they're there are like things to look forward through throughout the week.
Look forward to throughout the week.
Umm yeah, I need to use classdojo more this year, but I haven't been.

Speaker 1 25:27
It's.

Speaker 2 25:29
So I used to use that as like a reinforcer as well.
Umm, not this year.

Speaker 1 25:39
OK.

Speaker 2 25:39
So yeah, those are just some things.

Speaker 1 25:43
OK, perfect.
OK.
And 17?
What learning challenges related to umm, OK, so this is kind of like a summation of of all the challenges that you have mentioned.
So what learning challenges related to low functioning autism do you observe when working with students in your online online class?
With the biggest revision.

Speaker 2 26:13
Ohh.
Just.
The biggest challenge I guess would be like the participation level, if that Council, I'm not sure, but just making sure that everybody is actually participating in some sort of way, whether it's like a poll or or or like a type in chat or raising their hand.
Umm I I think that that that can be challenging cause a lot of our kids log in, have their camera off and then I'm not sure if they're actually there or is only now.
So sometimes if they're not participating, so I would find I find that challenging.

Speaker 1 27:00
Umm.
OK.
OK. Thanks.
Umm.
And then what types of restricted and repetitive behaviors do you observe when working with students with low functioning autism?
And so the other things like hand flapping, pacing, rocking back and forth.

Speaker 2 27:25
So I definitely see like rocking.
I do see kids get up and pace.
Umm I have seen the kiddo with holding holding something.

Speaker 1 27:38
In.

Speaker 2 27:38
So.
So these are all different, different things that I've I've seen, but most of the time they're cameras are off, yes.

Speaker 1 27:49
OK.
And.
19, OK, so we have three more question.

Speaker 2 27:58
OK.

Speaker 1 27:58
Ohh, what maladaptive behaviors do you observe when working with students with low functioning autism in your online class?
So these are behaviors that prevent them from learning or prevent other students from learning.

Speaker 2 28:13

Umm.
Well adapted behaviors so maybe umm them focusing on something else in chat and kind of getting everybody else on whatever they're focusing on instead of the subject.

Speaker 1 28:28
OK.

Speaker 2 28:28
Umm, that's a behavior I see sometimes.
Umm.
I mean, I guess I've seen some of the students argue amongst each other and chat.

Speaker 1 28:44
Hmm.

Speaker 2 28:45
There's that.

Speaker 1 28:48
OK.

Speaker 2 28:50
Yeah.

Speaker 1 28:50
Anything specific that you have noticed from your students who have autism?

Speaker 2 28:59
Home more breaks.
I feel like they like I I feel like I have a few students that will request, like a break away, but that's a good thing, not a maladaptive behavior.
I think sorry, so I'm not sure what I'm answering anymore.

Speaker 1 29:12
Hmm.
Umm like it?
Yep.

Speaker 2 29:19
Yeah.

Speaker 1 29:21
OK.
Ohh.
Gonna check some cats already minutes.
OK.

No, that that's fine.
Umm, OK oh this?
Well, OK, so this yes so question #20, how are evidence based practices for learning and for behavior modification like ABA practices?
I'm highly implemented for the students with autism in your class.

Speaker 2 29:45
Umm so just.
Front loading repetitive, making sure that students like everything's broken down and the they're understanding what I'm saying.
Umm, I've done the EPA for so long that I'm not a fan.
At least I'm gonna be honest.

Speaker 1 30:05
Umm, OK, OK no.

Speaker 2 30:08
So ohh, but yeah, yeah, just just a lot of like breaking things down and how they're due, done.

Speaker 1 30:09
Tell the truth.

Speaker 2 30:17
And they're like most simple steps like task analysis stuff, yeah.

Speaker 1 30:23
OK.
OK, turn up and then the second part of that is how are appropriate behavior and learning reinforced or rewarded amongst your students?
I know you mentioned the fun Friday class at the end of the week.
Sharing umm the.

Speaker 2 30:45
Lots of positive phrase.

Speaker 1 30:47
In.

Speaker 2 30:50
Umm honestly, haven't done as much this year for that.
Going to be honest.

Speaker 1 30:56
OK.

Speaker 2 30:58

Umm, it could be better.
This is my first year doing an online platform so.

Speaker 1 31:04
Umm.

Speaker 2 31:05
Some a little different than what I'm used to for like providing those positive behavior supports and stuff like that.

Speaker 1 31:14
OK.
OK, no worries.
And then lastly, describe the most not.
This is a kind of a two part question.
Describe the most successful evidence based practices or ABA strategies that you use when working with your students with autism Online.
So the most successful of these practices?

Speaker 2 31:40
Umm.
I don't know.
Like we've like chunking and reviewing things regularly, like repetition.

Speaker 1 31:55
OK.
And then, umm, what are some of the responses that students with autism but give you when you use those strategies?
How do they respond to those?

Speaker 2 32:07
Umm, typically I get a little more participation, so they'll actually like answer the question or respond instead of ignoring for not communicating it.

Speaker 1 32:24
OK.
Alright.
Thank you.
Thank you.
Thank you.
And then is there anything else that you would like to add to our discussion regarding your experiences with students with low functioning autism that we have not discussed?

Speaker 2 32:40
I don't think so, [redacted].
I think I'm good.

Speaker 1 32:42
OK, alright, thank you.
Well, that concludes our interview.

Speaker 2 32:48
OK.

Appendix F: Focus Group Questions

1. Thank you for participating in this focus group. Please briefly describe your current position as a teacher of students with LFA (i.e. type of class/subject, grade level, etc.) (CRQ)
2. Describe your challenges when working with students with LFA and challenging behaviors in a VLE. CRQ
3. Describe successful practices you've used to support students with LFA and behavior challenges in a VLE. CRQ, SQ1, SQ2, SQ3
4. How often do you attend school-initiated professional development trainings related to supporting students with LFA (less than 5 days a year, about 5 days a year, more than 5 days a year)? CRQ
    a. Have these trainings been related to supporting students with LFA in a VLE? If so, how many? (follow-up) CRQ
5. What experiences or trainings have you had that have prepared you to support students with social communication challenges? CRQ
    a. What experiences or trainings have you had that have prepared you to support students with social communication challenges in a VLE? (follow-up) CRQ
6. What experiences or trainings have you had that have prepared you to support students with increased or abnormal sensory interests? CRQ
    a. What experiences or trainings have you had that have prepared you to support students with increased or abnormal sensory interests in a VLE? (follow-up) CRQ
7. What experiences or trainings have you had that have prepared you to support students with hyper- or hypo-sensitivity? CRQ

    a. What experiences or trainings have you had that have prepared you to support students with hyper- or hypo-sensitivity in a LE? (follow-up) CRQ

8. Challenging behaviors that are demonstrated by students with LFA are often related to communication challenges, anxiety avoidance, sensory-seeking, and access to tangibles. What experiences or trainings have you had that have prepared you to address these functions of challenging behavior? CRQ
    a. What experiences or trainings have you had that have prepared you to address these functions of challenging behavior in a VLE? (follow-up) CRQ
9. Would you like to share anything else about your experiences in supporting students with LFA and challenging behavior in VLEs? CRQ

Appendix G: Video Journal Prompt

1. What advice would you give school administrators regarding trainings that you would like to see more of to support and equip people (teachers, administrators, support staff, and family members of the student) who support students with Low Functioning Autism (LFA) (requiring substantial or very substantial support with intellectual disability) in virtual learning environments?

Appendix H: Screening Survey

Please provide a yes or no response to the questions below

12. Do you have a Bachelor's Degree or higher?
    a. Yes
    b. No
13. Do you currently hold a moderate-severe Special Education Teaching Credential?
    a. Yes
    b. No
14. Do you have 3 or more years of experience as a Special Education Teacher?
    a. Yes
    b. No
15. Do you currently teach students from one or more grades from 6^{th} -12^{th} grade online?
    a. Yes
    b. No
16. Do you currently teach students with Autism Spectrum Disorder (ASD) online?
    a. Yes
    b. No
17. Do you currently teach students with Low Functioning Autism (Level 3 ASD or Levels 2-3 ASD with Intellectual Disability [ID]) online?
    a. Yes
    b. No
18. Do any of your students with Low Functioning Autism have behavioral challenges?
    a. Yes
    b. No

Thank you for taking the time to complete this screening survey. Should you meet the eligibility criteria for this study you will be contacted via the email you provided.