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Effective Learning and Behavioral Strategies and Supports for Low Functioning Students with Autism

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EFFECTIVE LEARNING AND BEHAVIORAL STRATEGIES, INTERVENTIONS AND SUPPORTS FOR LOW FUNCTIONING STUDENTS WITH AUTISM

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Abstract

This thesis set out to research current literature and research regarding various aspects of working with low functioning students with autism. It contains information regarding learning styles for typically functioning students, as well as learning styles and strategies for low functioning students with autism. Examined closely in this thesis are the pieces that go into developing a comprehensive treatment plan for students with autism. It covers three different levels of academic and behavior interventions, as well as the implications they could hold for low functioning students with autism. Communication skills and strategies were also examined and expert practitioner interviews were conducted as well. The thesis concludes with a summary the authors thoughts regarding cognitive learning strategies for low functioning students with autism.

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CHAPTER I: INTRODUCTION

History of Special Education

Education for individuals with disabilities has been a constantly evolving system in public schools since the early days of American schooling. Even into the late 20th century, 1.8 million students with disabilities were excluded from accessing public education (Duncan, 2015). Children with disabilities were often stigmatized and regarded as a source of shame and guilt amongst their families. Often, these children were hidden in institutions and never spoken of or mentioned. In 1975, the federal Education for all Handicapped Children Act (EHA) required all public schools to guarantee a free, appropriate public education for all students with disabilities. Even with the passing of federal legislature, schools still struggled with what constituted an appropriate education for disabled students, and often the inclusion of these students was considered to be a waste of educator's time and an unnecessary demand. In 1990, the Americans with Disabilities Act (ADA) was passed and ensured equal access and treatment for people with disabilities. The current iteration of this mandate is called the Individuals with Disabilities Education Act, and has been the driving force in special education reform to this day. According to the Education Commission of the States, the number of students with disabilities have increased from 3.7 million, to over 6.7 million (Griffith, 2015).

History of Autism

The first clinical mention of autism like symptoms came from Leo Kanner in the early 1940s. Following his published observations, an explosion of theory and research followed, often misguided and resulting in mistaken intervention (Thompson, 2013). For years, these children were considered "uncurable", and autism was believed to have a biological root. During this time, it was widely thought that nothing could be done by educators, and almost half of all of

the children with autism were institutionalized (DeMyer et al, 1973). In the last 30 years, research of autism and its symptoms have grown from very little to an overwhelming amount. Three major factors have contributed to this change in scientific advancement and approaches.

Firstly, the idea that autism is an untreatable disorder has changed, and it is now widely believed to be treatable and manageable with effective methods and intensity. Secondly, it is now known and recognized that autism has its basis in cerebral dysfunction, and many parts of the brain can be involved in what symptoms manifest themselves. Autism is a family of overlapping conditions, and there is no single, homogeneous autism disorder. Third, technological advances have allowed for greater understand and ability to uncover possible sources and roots of the symptoms that are associated with autism (Thompson, 2013). These three factors have changed the understanding of autism, and have altered the course of its treatment since its initial discovering in the 1940s.

One of the main findings of all of the recent research indicates that for many children with autism, early intervention may promote brain activity in the affected areas, which normalizes some functioning. Now, the possibility of combining evidence-based therapy in the areas of academics, behavioral interventions and communication provide a possible avenue for training autistic children to lead as independent and normal life as they can.

Reason for Topic Choice

There are many reasons the author chose to research strategies for teaching autistic students. The author is currently a teacher of this specific population, and is something that he is very passionate about. With the alarming lack of research regarding best practice teaching strategies and interventions around low-functioning students with autism, educators of this population of students would benefit from compiling the most recent research on potential

interventions that could be used in the classroom. Recent federal legislation has turned its focus to the use of scientifically backed and researched methods of educating students both in the mainstream classroom and in special education (Individuals with Disabilities Education Improvement Act [IDEIA], 2004; No Child Left Behind Act [NCLB], 2002). Further, these mandates call for "high-quality teachers", who are required to undergo training to improve classroom instruction and success. As the prevalence of students with disabilities increases(Griffith, 2015), it is inevitable that teachers will encounter students with disabilities in their classroom. It is imperative that teachers be trained in the many different type of intervention strategies that could be utilized in their classrooms. Because of the unique nature of students with autism, there is no single, proven method or strategy that can be used in every particular case.

Because of the growing and varied educational needs of students with autism, training for teachers is complex and challenging. Establishing a singular, evidence-based intervention is next to impossible, which in turn means that the best practice for teachers is to be trained in all sorts of intervention strategies backed by scientific proof. For students with autism, some of the more common strategies that are frequently advocated for use include: 1:1 discrete trial training, pivotal response training, incidental teaching, positive behavior support plans (PBSP) and Picture Exchange Communication Systems (PECS). Each of these strategies have shown efficacy in the classroom with specific types of students with autism (Morrier et al, 2011). While these strategies are the most commonly used and advocated strategies for low functioning students with autism, most educators are rarely using evidence based strategies with autism (Hess et al. 2008). In order to best educate these students, the education system must find a way

to make certain that teachers are trained and prepared to educate this growing population of special education students.

Thesis Questions

This thesis set out to answer and investigate the following questions: What are the commonly used cognitive learning strategies for low functioning students with autism? What are the implications for these strategies regarding their implementation for low functioning students with autism? What are the most commonly used evidence based practices used to teach low functioning students with autism communication skills? What are some current expert practitioner opinions regarding learning strategies, coping skills for social/emotional challenges, behavioral challenges and communication skills for low functioning students with autism?

CHAPTER II: LITERATURE REVIEW

Overview of the Research Process

The research for this study was conducted using academic peer-reviewed articles. The articles have been retrieved from online databases such as Academic Search Premier, ERIC and Educator's Reference Complete. Historical information and current intervention methods was collected from informational reports. Key words used in this thesis include Autism spectrum disorders, autism, cognitive learning styles, low functioning, communication, visuals, video modeling and behavior management. While researching peer-reviewed empirical studies, articles were examined and chosen based on their age and relevance to current academic practices. Information presented regarding specific intervention strategies is intended to be informational and comparative pertaining to their proven success. First hand accounts from professionals in the academic field are provided to demonstrate the current success and relevancy for the strategies chosen for research.

History of ASD Revisited

With the increase in amount of students with disabilities being served and treated in public schools, current educators face myriad new challenges when it comes to providing the most inclusive and effective teaching environment possible. Between 2003-2013, the number of students reported to be identified with Autism Spectrum Disorders (ASD), increased by 264% to over 500,000 students (Griffith, 2015). This means that educators are faced with an increasing number of challenges posed by students identified with ASD.

Considering the recent explosion of research in the field of autism spectrum disorders, the way that students with autism are treated in schools has evolved since the first time the disorder

was publicly recognized in the early 1940s. Students are no longer institutionalized, and instead are afforded an appropriate education and treatment within their public education career. Federal acts such as the Individuals with Disabilities Education Improvement Act (IDEIA, 2004) guarantee this. It is now on the school system to train their teachers and staff in the highest quality of educational practices that can be had. With the overwhelming amount of practices and strategies that are possible, finding the appropriate method for each student can amount to what may feel like a needle in a haystack. This is why it is crucial that educators seek the training and information regarding best practice to the best of their ability.

Cognitive Learning Styles

Cognitive Learning Styles for Typical Students

Education in public schools is a constantly changing and evolving practice. Over the years, there have been many different reforms. Currently, students with disabilities are educated for 80% of their day or more in general education settings, and are required to meet the same expectations and rigor as their non-disabled peers (Cook & Rao, 2018). It shouldn't be surprising that students with disabilities continue to perform well below their non-disabled peers, as reported by the National Center for Learning Disabilities (Cortiella & Horowitz, 2014). Because of these high standards for education, it is worth investigating the most effective strategy for mainstream education.

As of recently, the focus has turned to evidence based practices. One of the most commonly accepted and used framework is the Universal Design for Learning (UDL). UDL is widely considered a framework that can be used to design instruction for all learners, as opposed to modifying instruction for specific learners. Teachers can use the UDL framework to plan their

lessons, as it provides consideration for flexibility and its supports can benefit a range of students (Cook & Rao, 2018).

UDL has two foundational guidelines. The first one focuses on the curriculum being disabled, not the student. By viewing the curriculum as the problem, teachers can approach educational challenges in a new light. The second guideline is to "reduce barriers" within curriculum and instruction. If educators can identify these barriers that exist in their curriculum and instructional practices, educators can proactively find ways to add flexibility, supports and scaffolds that will reduce and eliminate these barriers (Cook & Rao, 2018).

Cook & Rao (2018) go on do describe the guidelines of UDL even further:

> "The UDL guidelines are organized under three main principles-providing multiple means of (a) representation, (b) action and expression, and (c) engagement-that are derived from research on learning networks in the brain." (p. 179-180)

The UDL guidelines provide ways that options and supports can be proactively built into lesson planning in order to increase student access to curriculum and instruction. UDL believes that learner variability is the norm, and teachers can address learner variability by designing and shaping their instruction to include flexibility, choice and engagement to support all learners, general education and special education alike (Meyer et al, 2014). When selecting educational practices and interventions, Cook & Rao (2018) suggest that teachers identify practices that are designed to improve outcomes that align with the individual need of the student, and are supported by methodologically sound research. In doing so, teachers can be more confident in the effectiveness of their practice, and in turn deliver it with highest level of quality possible.

Because students with learning disabilities are entitled to specialized programming to meet their individual learning needs, this sort of approach is very promising in its ability to address many students with disabilities, not just students with autism. Teachers can consider specific student student interests when formulating their lessons, which can be very valuable for engaging higher functioning autistic students in the mainstream classroom. Cook and Rao (2018) suggest that using the UDL guidelines in conjunction with other evidence based practices, educators could see a marked increase student engagement in the classroom, and therefor success.

Cognitive Learning Styles for Students with ASD

Restricted Interests

An autistic student carries their own unique challenges in school. They can range from sensory perception and motor control, to learning, memory, language and social interaction (Qian & Lipkin, 2011). These issues can range in severity, and each provide educators with considerations and challenges to overcome on a daily basis. With the scope of interventions for autistic students being so varied, there are many different approaches that educators can employ in the classroom. Intensity of intervention varies by student, and finding the intervention with the lowest level of restriction is mandated by law (e.g.) Individuals with Disabilities Education Act of 2004). The reason for inclusive education is to improve the social and educational experiences of all children, and to improve academic attainment (Gunn & Delafield-Butt, 2016).

For students with autism, special education needs can result from several factors, all of which fit one of four themes listed in Gunn & Delafield-Butt (2016). They are as follows: learning environment, family circumstances, social and emotional needs and health/disability. For higher functioning students with autism, a very common characteristic that

they may have is restrictive interests (RIs). This can prohibit them from being willing and/or able to focus on new content or topics presented in the mainstream classroom. There are many differing theories and practices in how teachers address these concerns, and there is no general consensus for what the best practice is in regards to RIs. Some teachers work to incorporate these interests into class, and encourage learning through these RIs. Others may find them distracting, and choose to avoid working them into class topics and learning targets. Thirdly, some teachers choose to use RIs as a reward for task completion and good behavior. All approaches towards RIs are understandable, and Gunn & Delafield-Butt (2016) intended to determine the best practice.

RIs are part of the formal clinical diagnosis for autism, and can be particularly difficult to eliminate completely. They can potentially interfere with an individual's ability to function in daily life, and also limit student interactions with peers and opportunities to learn. Yet, according to the authors, RIs indicate significant child-led, self-motivated learning. The process that a child with autism undergoes when developing RIs involves engagement in a topic, motivation to develop knowledge and understanding, and employment of psychological and material resources. In short, development of RIs may follow the principal components of learning. Because of this, RIs can be seen as useful expressions of interest that can use and expand cognitive skills, social sharing and cooperativity, as well as emotional or arousal self-regulation (Gunn & Delafield-Butt, 2016; Leekam, Prior, & Uljarevic, 2011).

According to Leekam, Prior and Uljarevic (2011), RIs are more prevalent in individuals who fall on the higher functioning end of the autism spectrum. Approximately 90% of students regarded as high functioning autism display RIs. To date, there has been a lack of comprehensive research of whether working or not working with RIs is beneficial or

detrimental. Educator attitude towards RIs seem to be the only factor that determines whether or not RIs are addressed or not addressed in the classroom. For some students, incorporating RIs into the mainstream classrooms could be a creative way to meet the needs of an inclusive classroom. For higher functioning students, best practice interventions can be worked into mainstream or supported classrooms with minimal amount of extra work or time. According to Gunn & Delafield-Butt (2016), incorporating RIs into the curriculum can be as simple as permitting students to research non-preferred topics using preferred research methods, or vice versa. For many of these students, the belief that RIs can be utilized as a strong motivator for appropriate classroom behavior. Whilst using student interests to prompt learning is not a new idea, it is certainly a useful tool for educating students who are developing the ability to learn in a classroom.

As much as educators may want to incorporate RIs, it isn't always practical. In these instances, Gunn & Delafield-Butt recommend using them as reinforcement for expected classroom behavior and task completion. Using a visual schedule such as a First/Then board could be a great tool for educators to show students how they will gain access to preferred items or activities. Research has shown that using visual mapping in the form of a First/Then schedule increases a student's tolerance for delayed gratification, and shows that a delayed schedule of reinforcement is an effective strategy to decrease unwanted behaviors and increase the wanted behaviors (Boesch et al. 2015). In conclusion of their research, Gunn & Delafield-Butt encourage that teachers who are required to employ an inclusive classroom approach be provided further training and learning opportunities to determine how best to work with students with autism, and in turn use RIs in the most appropriate and effective manner for their students.

TEACCH Model

Being able to engage learners through their specific interests and knowledge is an incredibly useful tool for helping educators reach students and access higher levels of learning that would otherwise be unattainable. However, for many students with autism, this may not be the only answer to unlocking their learning potential. Some students may require further intervention strategies to reach their learning potential. For students who require more structure and scaffolding, a program that utilizes the TEACCH program could find success. TEACCH stands for "Treatment and Education of Autistic and Communication related handicapped Children". The TEACCH program is a highly structured, comprehensive program that encourages student independence through utilizing structure, visual supports and strong motivators. The TEACCH approach is referred to as "structured teaching", and is based on evidence and observation that individuals with autism share common neuropsychological deficits that make up the "Culture of Autism". These deficits include:

> "1. Relative strength in and preference for processing visual information. 2. Heightened attention to details, but difficulty with sequencing, integrating, connecting or deriving meaning from them, 3. Enormous variability in attention. 4. Communication problems, which vary by developmental level, but always include impairments in initiation and social use of language. 5. Difficulty with concepts of time including moving through activities too quickly or slowly and having problems recognizing the beginning or end of an activity, how long an activity will last, and when it will be finished. 6. Tendency to become attached to routines and the settings where they are established, so that activities may be difficult to transfer or generalize from the original learning situation. 7. Very intense interests and impulses to engage in favored activities

> and difficulties disengaging once engaged. 8. Marked sensory preferences and aversions." (Mesibov & Sperry, 2005, p. 373-375)

The TEACCH program provides support for students within this "Culture of Autism" with four main components. They are a) Structuring the environment and activities in ways that are understandable to the individual; b) using individuals' relative strengths in visual skills and interest in visual details to supplement relatively weaker skills; c) using individuals' special interests to engage them in learning; and d) supporting self-initiated use of meaningful communication (Mesibov & Shea, 2009). Within these components, students' academic day is supported with a significant amount of structure. Structure is a vital component of autism interventions in any setting a child is receiving in any setting. Mesibov & Shea define structure as the "organization of time, space, and sequences of events within the environment in order to make learning activities clearer and easier to perform.". Within the TEACCH method, structure is used in four different ways. The first of these ways being physical structure, as in how the furniture is arranged in the classroom, or how visual cues show a student which activities occur in specific areas. Physical structure should also take into account environmental sources of distraction and stimulation. This can mean something as simple as facing a student's chair away from a window or door, in order to minimize the amount of extra input that the student is getting from their environment. The second type of structure involves the way that the sequence of events for the day is organized and communicated. This aim of this type of structure is to make a student's academic day understandable and meaningful. Typically, this structure involves some sort of schedule that involves visual prompts, such as pictures or symbols that have to do with specific tasks or activities. In some cases, teachers have opted to use actual items that are used

within the task that is coming next, such as a spoon that a student will need for their upcoming snack time. The TEACCH program encourages higher functioning students to move away from needing actual items, and to use visual symbols more prominently as the student is able. The third kind of structure refers to the manner in which individual tasks are organized and laid out using visual means. Tasks need to communicate a) What the student is supposed to do, b) How long the activity will last or how many repetitions will be done, c) How the student can see that progress is being made towards being finished, d) How the student will know that the activity is finished, e) How the student will know what they will do next. The final kind of structure outlined in Mesibov & Shea refers to the linking of individual work tasks into a sequence of activities, called the "work/activity system". The goal of this type of structure is to increase the amount of time that a student is meaningfully engaged in productive activities. Or more simply put, time on task. When all four types of structure are utilized, the TEACCH program has been documented and shown to be effective in its goal of increasing student independence. Hume (2009) showed an increase of on-task behavior and accuracy, decreased adult prompting and task completion duration. An echo of the Mesibov & Sperry (2005), these findings conclude that the TEACCH program is an effective tool for students with moderate to significant autism spectrum disorders that can lead to increased relatedness, more appropriate affect, more meaningful engagement with activities, and less repetitive, self-stimulatory behavior.

STAR Program

While there are many tried and true interventions for high and moderate functioning students with ASD, there is a lack of research done on students who suffer from significant ASD challenges. Significant challenges for these students are considered as significant communication delays, sensory processing issues and behavioral challenges. Interventions

designed to treat these challenges are often in depth and very structured, and require a significant amount of consistency and routine.

Given that most students who receive treatment for ASD receive it in the classroom, these interventions are particularly important. Pellecchia et al (2015) state that possible interventions "...can include both structured and naturalistic instructional techniques and may be used with groups or individuals.". Regardless of approach, all significant interventions require a significant amount of staff training and time in order to be successful. Many behavioral interventions are commonly based on applied behavioral analysis. In Pellecchia et al (2015), the authors break down one of the most common intervention curriculum used in schools, the Strategies for Teaching based on Autism Research program (STAR). It utilized discrete trial training, pivotal response training, and teaching functional routines as a base for teaching significantly disabled students in the classroom.

Discrete trial training (DRT) involves working 1:1 with a student in a highly structured setting free from distractions. It involves mass trials, and the repeated practice of same response for successive teaching episodes and the use of reinforcers unrelated to the response. It is a highly structured program that can address a wide range of needs. Pivotal response training (PRT) involves a more loosely structured session, where instruction is initiated and paced by the student, and typically the reinforcers are related to the content area. When getting instruction in a PRT session, the teacher follows the student's lead in capturing and contriving teachable moments related to context. Functional routines consist of predictable activities broken down into series of expected steps that occur naturally throughout the task. Functional routines provide systematic and predictable structure to activities in order to prompt students towards being as independent as possible in their daily life. Functional routines are designed to address

common daily activities, such as using the restroom, accessing the classroom, or eating a snack. When combined, the STAR program aims to address student independence and daily living skills by reinforcing and repeating simple, structured tasks found within each specific activity. STAR recommends that each student receive at least 2 DRT sessions, 1 PRT session daily. Functional routine instruction is designed to happen naturally throughout a student's day. As to be expected, there is a significant amount of training and learning that staff must undergo in order to be competent in administering the program as it is intended to be used.

According to Mandell et al. (2013), practitioners of the STAR program must undergo 3 days of intensive training before the start of the school year, intensive testing of students to design the classroom and lesson plans, ongoing full day quarterly workshops during the school year, and ongoing coaching provided in the classroom with classroom staff for 2-3 hours per week, twice a month. The amount of training involved in adequately using the STAR program is a significant amount of time to commit to such a specific curriculum used for a specific niche of students, that many question the value and validity of it in a school setting.

According to Pellecchia et al. (2015), effectively identifying the core components of a treatment package would facilitate the the development of of more cost effective treatments that could feasibly be implemented successfully in the public school classroom. Following their study, Pellechia et al. stated that they were unable to find high fidelity in any component of the STAR program in urban public school usage, largely due to under-resourced special education classrooms. In general, there were no high fidelity scores in any of the classrooms surveyed, and none of the classrooms were able to employ the program as intended with the suggested amount of intensity and frequency. Reasons listed for the discrepancy included: teachers' attitude and beliefs about the intervention, level of administrative support, and student disruptive behavior.

The author of this thesis has used the STAR program in his own classroom, and can attest to the amount of time, resources and consistency required to be intrusive towards using the program with any sort of fidelity over the course of a school year. Despite these challenges, Pellechia et al. did find increases in cognitive ability following implementation of the program, and list the aforementioned reasons for discrepancy as the most likely barriers for success when implementing the STAR program in its entirety with the highest level of fidelity. In conclusion, Pellecchia et al. suggest that performance feedback is a method of consultation approach that has been shown to increase treatment fidelity in high needs educational settings, and their final suggestion is to take a comprehensive approach such as the STAR program, and identify the core components that are found to be the most successful and utilize only those areas. The author of this thesis utilized a similar approach in his classroom, and found it to be successful in addressing specific areas of need.

Implications for Students with Autism

With the scope of autism spectrum disorders being so wide and varied, it is up to educators to become familiar with the type of needs that are present in their classroom, and what sort of interventions could be utilized. Examples of different types, and different intensities, of interventions have been listed in detail in this thesis. For the focus of this thesis, the author has chosen to focus on individuals with significant deficits in the areas of communication and behavioral challenges stemming from a diagnosis of autism spectrum disorders.

Sensory Dysregulation

Individuals with autism can potentially have to manage significant behavioral and sensory dysregulation. Dysregulation manifests itself in many different manners, all ranging in severity and intensity. For the focus demographic of this thesis, specific examples of behavioral

dysregulation include, but are not limited to: aggression towards others, self injurious behavior, severe antisocial tendencies and severe mood dysregulation problems (SMP). Severe mood problems in in students include high levels of irritability, often manifested by temper tantrums, as well as low and labile mood (Simonoff et al, 2012). For many students with autism, these behavioral issues can create many obstacles in the classroom and prohibit them from learning at their full potential. As stated in Gonthier et al. (2016), these behavioral dysfunctions can be a result of an individual with autism spectrum disorders' sensory dysfunction. Their data confirms that sensory abnormalities are highly prevalent in low-functioning individuals with autism. Further, sensory abnormalities and differences can be reliably observed in a wide range of ages. Within these sensory differences and abnormalities, there are 4 distinct sub-profiles of which they can all be categorized into. Individuals with autism can be split into these four sub-profiles: over-sensitive, under-sensitive, passive and balanced. Definition of these clusters are summarized as follows:

> "Over-sensitive: High level of isolation seeking, displaying less emotional lability than others. Relatively more autonomous than the other clusters. Under-sensitive: Larger range of behavioral disorders. More emotional disorders, with high levels of irritability and aggressiveness, anxiety and expression of affectivity. Tend to show more difficulty with relationships than the other clusters, have higher levels of social behavior disorders and aggression towards others. Their behavior was more influenced by environmental stimuli, and they tend to display a significantly higher level of self-aggression.

> Passive: Characterized by their unresponsive behavior, with high isolation, hypoactivity and apathy, disinterest and indifference, but also deficits in social interaction and eye contacts. They displayed less reactivity to change and to sensory stimuli than other clusters, as well as less emotional lability and less aggression towards others.
>
> Balanced: Lower scores on self-stimulation and reactivity to sensory stimuli, confirming their overall milder sensory dysfunction. These patients also had the least behavioral disorders of all: they were either equally impaired or significantly less impaired than the other clusters on virtually all subscales."
>
> (Gonthier et al. 2016, p. 3084-3085)

Low functioning students with autism encounter many different types of sensory stimuli throughout their school day. Because of their low level of autonomy, low functioning students with autism are especially susceptible to sensory dysregulation because they are unable to manage or use coping strategies independently. Sensory abnormalities play a critical role in how well students are able to manage their behavior throughout the school day, and educators can play a crucial role in aiding and teaching coping skills and mechanisms. It can be strongly beneficial for educators to be familiar with a student's profile of sensory dysregulation, because understanding these intricacies will allow for a teacher to fully unlock a student's academic potential.

TEACCH vs. STAR Program

When it comes to low-functioning students with autism, there are many different strategies that can be helpful. Two of which are explored in detail in this thesis. The TEACCH

Model and STARS Program are widely used in various treatment settings, and the success varies (Pellecchia et al., 2015; Delafield-Butt, 2016; Callahan et al. 2009). In Callahan et al.(2009), the research comparing an ABA style approach like the STARS program and the TEACCH model are compared. The findings conclude that both models are have very questionable results when used as intervention methods for low functioning students with autism with high levels of success in the public school classroom. One of the main concerns in the article was the variability in what was considered successful treatment of sensory dysfunction, and how to accurately measure the comprehensive success of either program. The authors of the article suggested that before applying any of the treatment measures in the classroom, the teacher must first identify core targets for intervention, and define their terms of success. In short, this could mean that teachers use parts of each intervention to appropriately address specific student needs in their classroom, and how each one will allow for greater student success. The author of this thesis has used both methods in his classroom, and can attest to the success of using individual aspects of each approach. However, using the entire comprehensive manner of each intervention requires a pervasive amount of initial and ongoing training to use them as intended. In conclusion, Callahan et al. (2009) suggested there is no clear preference for either model, and state the need for further research and study to be done to define what could be meant by a comprehensive treatment model.

Communication Skills for Low Functioning Students with Autism

It is clear that sensory dysregulation is the root of behavioral dysfunction for many low functioning students with autism (Gonthier et al. 2016). One of the main reasons for this is due to the fact that low functioning students with autism have significant communication deficits. Significant communication deficits can cause students with autism to develop atypical means of

conveying their needs to family, teachers, paraprofessionals and peers. For low functioning students, this can be especially problematic. Because they are unable to communicate when they are experiencing sensory dysregulation, the behaviors that develop in its absence have the potential to be severe and harmful. Examples of these behaviors include self-injury, aggression towards others, and property destruction. For example, if a low functioning student with autism wants their teacher to give them space, they may hit their teacher instead of asking appropriately for the teacher to move away or give them more space. If these behaviors go unaddressed, they will almost certainly get worse until the person experiencing dysregulation gets their needs met. The impact of these potential behavior challenges are highly dramatic, and detrimental to students not only in school but their social lives, and their opportunities in the community as well (Hines & Simonsen, 2008).

When it comes to addressing these behavior issues, a student's ability to communicate should be a core component of their treatment plan. Because students with autism have a higher propensity for visual learning, the most common method of treating communication deficits is the use of visual symbols. Education researchers define these visual supports as "concrete cues that provide information about an activity, routine, or expectation.". These supports should also involve some kind of support of skill demonstration (Kidder & McDonnell, 2017, p. 103-104). Further, Kidder and McDonnell (2017) state that "visual supports are an evidence-based practice for supporting learners with autism in achieving a variety of skills" (p. 103). Visual supports should be used as part of a comprehensive treatment plan for students with autism. According to Hines & Simonsen (2008), comprehensive treatment plans for students with autism must have five distinct components, they are as follows:

> "Comprehensive behavioral interventions a) address all the problem behaviors expressed by the child, b) are driven by the assessment outcomes, c) are applied across most or all of the child's day, d) typically incorporate multiple procedures, and e) fit into the context in which they are going to be implemented."
> (Hines & Simonsen 2008, p. 9)

Comprehensive treatment plans for low functioning students with autism should aim to be generalized across settings. This means that the scope of what they intend to address should not be contained to just one area, like school or home. In order to be the most successful in their communication, teachers and parents need to work closely to target specific skill sets and needs that they believe are the at core of a student's disability. Many low functioning students with autism have Positive Behavior Support Plan (PBSP) included with their Individualized Education Plan. These plans are designed to provide significant detail about the kinds of interventions and strategies that are included in a specific student's comprehensive treatment plan. A positive behavior support plan should approach behaviors from a strength perspective, and utilize individual preferences and goals to drive intervention strategies to utilize individual preferences and goals to develop interventions that support desired learning outcomes, behaviors and decrease less desired atypical or maladaptive behaviors in the student's life (Kidder & McDonnell, 2017). For low functioning students with autism, many require using specialized, discrete and visually-supported instructions to prompt their learning (Koegel et al, 2011). The use of visual symbols and cues are a staple in the range of tools that educators may use in these comprehensive treatment plans and in their PBSP. There is significant research to suggest that the use of visual symbols as means of communication is effective for low functioning students

with autism (Hartley & Allen, 2013, Lerna et al. 2013; Lorah 2018). In the public school system, the use of visual symbols is a heavily relied upon intervention. From an early age, students are taught to utilize pictures to make requests for items they want, to communicate feelings, and to follow routines. Once students learn that a picture corresponds with an item or word, they can begin to use these supports to convey a message. This ability to match objects to pictures could be the prerequisite for word understanding, which is the ability to match spoken words to the referred items (Low & Lee, 2011). In order for this to be possible, children must learn that verbal labels paired with pictures refer to symbolized referents rather than the pictures themselves, and can be generalized to objects that belong to the same category as the depicted referent (Hartley & Allen, 2014). Once a student is able to make the connections that a picture of an item refers to a real life item, these processes can begin to be practiced and utilized. One common method of using picture symbols is the Picture Exchange Communication System (PECS). It is a popular augmentative communication system that gets used quite often with non-verbal students. Many studies have shown that with repeated practice, use of a visual system of communication such as PECS can promote long term enhancement of socio-communicative skills in students (Lerna et al. 2013). The teaching of speech, language and communication skills to low functioning students with ASD requires a thorough understanding of their characteristics and deficits, and also a detailed planning of the teaching protocols (Low & Lee, 2011).

Expert Practitioner Input

Practitioners in the field were asked a series of four questions regarding topics researched in this thesis. The questions involved strategies for teaching transition skills as part of a comprehensive treatment plan, teaching coping skills for managing maladaptive behavior due to

sensory dysregulation, successful classroom strategies and also communication strategies and skills. The practitioners surveyed are teachers that the author of this thesis regards as mentors for his own career, and have helped shape his own teaching philosophy and beliefs.

Question 1: What are the most effective learning strategies in regards to academic or transition skills that you find helpful for students with severe ASD?

> "One learning strategy that I have found beneficial for students diagnosed with autism is structured work stations. This allows for students to have visual containing a concrete start and end time for activities. For students whom are non-verbal or have limited language, structured work stations help to limit verbal interactions between staff and students, and instead rely on the pictures and activity directive. Social stories also help to personalize academic and transition skills to meet the needs of each student."
> *Katherine Langdon, Communicative Interactive Disorders, Apple Valley High School*

> "Once physiological needs are met and there are reinforcements in place, the most effective learning strategies when working with students with severe ASD are visual structure, visual expectation and predictability. When students have limited communication and processing skills, the world around them becomes very chaotic causing anxiety and often severe behaviors. Making sure their environments and routines are visually predictable, along with using visual expectations, are the most effective and important strategies to use in a classroom that services students with severe autism. This does not necessarily mean showing students a visual or a picture. It means setting up your classroom in a predictable way visually and making sure each student knows how to

navigate and understands the environment. Expectations are predictable, actions are predictable, and people are predictable. A specific area is used for a specific task, a specific folder contains a specific work, a specific task consistently will indicate a specific transition that comes next."

Jenna Boutine, Students with Unique Needs, Dakota Ridge School

Question 2: What are the most effective strategies for helping students learn to manage the challenges involved with the effects that severe ASD has on their social/emotional functioning?

"Teaching the Zones of Regulations to my students has been extremely helpful for self-regulation and communication. This helps students to identify their emotions using pictures, colors or language. It is helpful for the staff working with each student due to the varying behaviors and triggers. Social stories and video modeling are two other great ways to identify emotions and teacher self-regulation to the individual student."

Katherine Langdon, Communicative Interactive Disorders, Apple Valley High School

Question 3: In regards to the uniqueness of behavioral challenges for lower functioning students with significant ASD, what are the most effective strategies that you have utilized to help students be successful in a classroom setting?

"It is important for lower functioning students with behavior challenges to have a structured sensory diet. Students need to be regulated to learn and having a sensory diet that is followed throughout the day can help calm a student and keep them focused. Another great teaching tool is first then duration mapping. This allows for student to know their schedule along with the amount of time they are expected to

perform a task prior to a transition. In my experience, when students have a predictable schedule it helps to lower anxiety and decrease challenging behaviors."

Katherine Langdon, Communicative Interactive Disorders, Apple Valley High School

"Following a hierarchy of needs for each student. Research shows that each student has a hierarchy of needs that have to be fulfilled before learning can take place. This will vary from student to student as well as day to day. This can be the most challenging part of educating students with ASD. Sometime students never get their physiological/biological needs met and incorporating the higher needs can prove extremely difficult."

Jenna Boutine, Students with Unique Needs, Dakota Ridge School

Question 4: With significant communication barriers affecting your students with significant ASD, are there any strategies or tools that you have found consistently successful in aiding these students with their communication?

"Proloquo2go is one tool that I have successful with students that have communication differences. When programed at the level each individual student needs, it is easy to access and manipulate. Also, it is can be edited to meet the needs of the learner in regards to their learning goals and objectives."

Katherine Langdon, Communicative Interactive Disorders, Apple Valley High School

"Communication for our students with significant ASD is challenging to say the least. Some students have severe deficits only in receptive language and some only in expressive language, and some have severe deficits in both. Beyond manding and tacting

for expressive language, a strategy that I have used in the past for receptive language is integrating the prompting hierarchy with students. With that you can find where their communication strengths are and where their needs are. Often, we combine prompts together and do not notice what the students actually understands. We may model something and pair it with a verbal. Although the child responds, we do not know for sure what they are responding to and those prompts are not next to each other on the hierarchy."

Jenna Boutine, Students with Unique Needs, Dakota Ridge School

CHAPTER III: DISCUSSION AND CONCLUSION

Summary of Literature

As the numbers of special education students in the United States grows (Griffith, 2015), the amount of educational needs in the school is increasing. Schools are tasked to provide an individualized and appropriate education for each one of these students. With the diversity of each specific learning disability, there seems to be no shortage of educational frameworks and theories. For students with autism, education must look different for each one, depending on the severity of the symptoms that they have. Autism spectrum disorders is a disability of the cerebral part of the brain, and can manifest itself in a multitude of different ways, with just as much variability in their severity.

For some students with autism, utilizing a general education framework such as Universal Design for Learning (UDL), could provide the amount of flexibility and engagement in the classroom to keep them in the least restrictive setting possible. When used in conjunction with a students restricted interests (RIs), it can be a very powerful and successful tool in an academic setting.

Other lower functioning students with autism may benefit from a more structured program, such as the TEACCH model. Within the structure of such a model, there is a significant amount of visual supports and structure that can help cue a student within a task, and can reach as far as prompting a student throughout their entire school day (Kliemann, 2014). Using a model such as this can be used to teach a student with autism a degree of independence and autonomy, something which many lower functioning students lack.

In the case of the lowest functioning students with autism, the most basic of concepts can be taught through a program such as the STAR Program. It provides structured, 1:1 training

where many pre-learning skills can be taught through discrete trial training, pivotal response training, and functional routines. A program such as the STAR curriculum can be considered one of the most restrictive settings, as it calls for a student to be 1:1 with a staff member throughout the day and during learning tasks.

At the core of lower functioning students with autism, there is often a complete or significant lack of communication skills. Utilizing the STAR Program, teachers can help students build a concept of object-picture relationship, and in turn use that to prompt successful communication in the classroom. Using a system such as the Picture Exchange Communication System (PECS) can help a student to generalize this skill, and hopefully use it in more than just the school setting. Teaching an autistic student to communicate should be a critical item within that specific student's comprehensive treatment plan, and often is used as part of a Positive Behavior Support Plan (PBSP).

Limitations with Research

The most common limitation within research regarding students with autism is the uniqueness that each student has. Autism is so specific to an individual student, that often it can be difficult to pinpoint one skill and measure it accurately in each student. Studies typically have some variability due to the complexity of each individual in the study. Therefor, another limiting factor in these studies is the lack of strength due to the amount of participants involved. If a certain topic is researched in a case study, it it not considered applicable to each case, however the findings can still be utilized should another specific student display the same behavior or need that was researched in the study. Another limitation of studies is where they are conducted. Students with autism have home lives that are different than their school lives, and examining

them in cross settings would be pervasive and quite difficult. Generalizing one intervention or strategy is often difficult or impossible across settings.

Implications for Future Research

Research indicated in all studies surveyed in this literature review that even further research needs to be done in providing appropriate educational supports for students with autism. Many studies called for a better system of assessing sensory needs and success of individual programs. Several studies regarding the TEACCH model and STAR Program called for a better measure or method of success, as these programs are difficult to measure outside of a school setting. In all studies, both programs were noted to show promising results, regardless of their ability to measure intervention success at all times.

Professional Application

From all of the research cited throughout this thesis, the common thread is the more knowledge, the better. Teachers need to be well trained in the wide variety of different strategies and interventions that could potentially be used when instructing any student with autism, high functioning or low functioning. Only 15% of the in-service teachers reportedly received training in teaching students with ASD from their pre-service training programs in colleges and universities (Morrier et al., 2011). That number is staggering. In order to use programs like the TEACCH model, or STAR Program, districts and schools must take the next step and commit to training their teachers and staff in the variety of potential supports and interventions. Without doing so, teachers are not equipped to appropriately educate students with autism to the highest quality mandated by law.

In my career, I have used some form of all of these interventions in my classrooms. I can attest that implementing either the TEACCH model or STAR Program takes a significant amount

of resources. The time it takes to undergo the training in the entirety of the program, and to set up the students environment, and all the visuals can take weeks. School districts are often very hesitant to spend the resources to train the entire classroom staff in these supports, so the bulk of this preparation typically falls on the teacher. As does the ongoing training of staff as the year goes on, and maintaining the integrity of the program as a whole. It is increasingly difficult when you have students who have very significant needs as well, because the programs are designed to be tailored individually to each student.

The biggest challenge that I have faced when implementing these programs is maintaining the integrity of the program when it is being run by someone other than myself, such as a paraprofessional or another teacher. Usually what would happen is the program would start well, and as staff who were untrained began to be run programming, the importance of detail would be misunderstood, and aspects of the program would be forgotten or changed. In a classroom of low-functioning classroom of autistic students, there can be many staff members working these programs at the same time, and it can be difficult for one teacher to 100% fully implement and maintain these programs with staff who have not been officially trained. Simply providing training in the form of teacher relaying information that they have learned from the training is not enough. Districts need to commit to sending paraprofessionals with teachers to complete official training if the expectation for their teachers is to commit to running these programs with any sort of integrity.

Instead, I choose to implement parts of each program that I feel could be valuable for a specific student and their needs. By using the parts that I feel are the most necessary or important, I can better train my staff to operate these programs effectively, because I can spend more time on the details of why a particular student needs that specific intervention. As the

research in this thesis has stated, there are many different types of interventions, and many of them are considered best practice. In my professional career, I have considered it to be best practice when I am able to judge a student's comprehensive treatment plan as the sum of its parts, and its parts contain interventions from many different programs, all of which address the diverse nature of the student's individual needs.

Conclusion

This thesis researched several current issues and topics regarding the education of low functioning students with autism. Some commonly used cognitive learning strategies for low functioning include utilizing already established learner strengths and interests, such as their specific Restricted Interests (RIs). Even further structure and independence for these students can be provided with programs like the TEACCH Model, where students' entire day is heavily structured and supported. For the lowest of cognitive functioning learners, a program like the STAR Program can provide a significant level of structure and support while teaching many pre-learning skills and routines. While all of these strategies have proven to be useful and evidence based, there are several implications regarding their use in the classroom. The most overarching theme amongst all of these is the amount of training required to not only successfully implement them, but also maintaining them consistently over the course of the school day. It requires a significant amount of resources and commitment from a school and their district to dedicate said resources to them. Another implication is the success of these programs outside of a students school day. Once the structure is removed, there are many questions as to the success in these programs' ability to teach students to generalize skills in their home life. More research is needed in order to confirm the success of these programs outside of a school or clinical setting.

In regards to teaching low functioning students with autism communication skills, the highest regarded evidence based practice is using visual symbols. Employing a system like the Picture Exchange Communication System (PECS) can be useful for giving students means of autonomous communication. Again, the same implications apply. The significant amount of training for initial implementation and the ongoing maintenance can be a significant barrier for classrooms looking to provide this kind of support for their students. Also, the same concerns regarding the ability of this program to teach students the ability to generalize the skill across settings remains. Further research is required to determine the efficacy of the program outside of a school or clinical setting.

This thesis also contained input from expert practitioners in the field. They were surveyed with four questions regarding the areas of research that this thesis focused on. Their statements and input provided practical and honest insight into current practices and philosophies in the classroom. Both have experience with the programs mentioned and researched in this thesis, and their professional opinions and thoughts confirm much of what has been found in the research regarding these programs and their effectiveness.

Simply put, there is no single "cure all" for children and students with autism. Educators who teach students with autism are tasked with acquiring the knowledge of myriad programs, methods and frameworks to help them in teaching to the best of their ability. Research shows that there are successful, evidence based practices for students with all forms of autism, and teachers must be willing to seek them out and become trained in them.

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