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***A Case Study of Compounding Views of Paraprofessional Roles and Relationships in
Preschool Classrooms: Implications for Practice and Policy***

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Abstract

The purpose of this qualitative case study is to extend a previous study by Brown & Stanton-Chapman (2014) by exploring the dynamics between teachers and paraprofessionals in preschool classrooms. Specifically, researchers examined the relationship between eight paraprofessionals' perspectives of job responsibilities and satisfaction in comparison to their assigned eight teachers' perspectives of these same ideas. Data collection included semi-structured interviews of the 16 participants as well as classroom observations and document collection. Four key themes emerged from data collection: responsibilities are often influenced by the level of teacher and paraprofessional motivation; paraprofessionals often assimilate to match the lead teacher's demeanor and perspectives; teachers and paraprofessionals view recognition and appreciation very differently; and the majority of classroom outcomes are primarily influenced by structured school policies. Considering these findings, implications for practice and directions for future research are discussed.

Keywords: paraprofessional, teaching assistant, educational assistant, relationship, preschool

***A Case Study of Compounding Views of Paraprofessional Roles and Relationships in
Preschool Classrooms: Implications for Practice and Policy***

When 28 parents of children with disabilities were asked about paraprofessional supports for their child, 25 percent reported that paraprofessionals made inclusion in school possible (Werts, Harris, Tillery, & Roark, 2004). Additionally, 61 percent of the sample said their child spoke of the paraprofessional at home as much as he or she did about the classroom teacher (Werts et al., 2004). This finding is supported by a rich body of evidence that emphasizes the importance of paraprofessional relationships with teachers (Blalock, 1991; Burgess & Mayes, 2009), students (Broer, Doyle, & Giangreco, 2005; Healy, 2011) and families (French & Chopra, 1999; Werts et al., 2004). These relationships also play a central role in the academic and social outcomes for student success (Giangreco, Doyle, & Suter, 2012). For example, paraprofessional supports have been linked to increased social interactions among children from different backgrounds (Chopra, Sandoval-Lucero, Aragon, Bernal, De Balderas, & Carroll, 2004) and to an increase in academic achievement in inclusive settings (Giangreco, Smith, & Pickney, 2006). For these reasons, researchers studied the views and perspectives of paraprofessionals to obtain information on their classroom obligations, job fulfillment, and expertise (Giangreco, Edelman, & Broer, 2001). Yet, results have pointed to universally negative perceptions of the job of a paraprofessional due to the low wages, ambiguous responsibilities, and power struggles between paraprofessionals and teachers (Brown & Stanton-Chapman, 2014). Researchers studied this phenomenon in order to

understand why this job is viewed as undesirable despite the important impact paraprofessionals have in the classroom (Brown & Stanton-Chapman, 2014).

In a recent study of paraprofessional relationships, Brown and Stanton-Chapman (2014) used qualitative observations and interviews in addition to a quantitative survey to explore the relationship between paraprofessionals' perspectives of their responsibilities and the corresponding satisfaction and issues surrounding their job (Brown & Stanton-Chapman, 2014). Three key themes emerged from data analysis: a) there is often confusion over job responsibilities; b) job satisfaction is highly influenced by both monetary compensation and recognition; and c) relational power dynamics exist between teachers and paraprofessionals (Brown and Stanton-Chapman, 2014). And, interestingly, paraprofessionals and teachers viewed key classroom issues very differently. For example, while teachers often felt paraprofessional pay was adequate, paraprofessionals felt undervalued and overworked for the compensation they received (Brown & Stanton-Chapman, 2014). Findings also indicated that there were additional divergences between paraprofessional and teacher perspectives including: differences in perceived roles and responsibilities between the two groups, lack of perceived appreciation from the paraprofessional while teachers felt appreciation was adequate, and a back-and-forth exchange between paraprofessional motivation and teacher receptiveness to classroom responsibilities (Brown & Stanton-Chapman, 2014). This 2014 study did not explore these views in depth, however, and understanding these differences has potential to inform practice and further understand classroom relationships. The current study will explore this further through an in-depth case study of eight paraprofessionals and eight teachers in order to provide insight into the complexities of teacher and paraprofessional perspectives on multiple classroom issues (Stake, 1994). The present study will also include further analysis of paraprofessional and teacher dynamics and how these perspectives differ between both parties in the five key areas of extant paraprofessional research: skills/experience, job fulfillment, roles and obligations, preparation and coaching, and relationships with teachers and students (Brown & Stanton-Chapman, 2014). Findings from the current study hope to further inform researchers and practitioners about vital issues relating to different perspectives among teachers and paraprofessionals. These findings may provide implications for informing job responsibilities, increasing job contentment, and understanding how relationships function in successful preschool classrooms.

Literature Review: Five Key Areas of Paraprofessional Research

There are over one million paraprofessionals in PK-12 classrooms across the United States (Ashbaker, Dunn, & Morgan, 2010). Sometimes referred to as an instructional aide or paraeducator, a paraprofessional is an education employee who may not be licensed to teach but executes numerous classroom duties and collaborates with lead teachers for academic and behavioral support (Department of Education, 2012). Despite this definition, the responsibilities and job requirements vary based on locale (Allen and Ashbaker, 2004). However, there is a growing body of evidence to support paraprofessional efficacy in many roles including: assisting students with disabilities (Werts et al., 2004), collaborating with teachers and parents (Chopra & French, 2004; Giangreco, Smith, & Pickney, 2006), and maintaining and supporting important classroom relationships (Burgess and Mayes, 2009; Lewis, 2004).

Over the past 30 years, a growing body of research has explored multiple aspects of the experiences of paraprofessionals. Several studies investigated paraprofessional assignments with individual students and noted the negative effects paraprofessional-student proximity can have on academic success and peer interactions (Giangreco, Edelman, Broer, & Doyle, 2001; Malmgren & Causton-Theoharris, 2006; Skar & Tamm, 2001). The overarching theme from these studies focused on the idea that paraprofessional-student relationships, and the proximity in which these two groups work, vary and can be both beneficial or detrimental for student success (Malmgren & Causton-Theoharris, 2006; Skar & Tamm, 2001). Similarly, studies in this area have also investigated the over-use of paraprofessionals for multiple classroom tasks including: behavior management, instructional planning and delivery, and contact with families (Broer, Doyle, & Giangreco, 2005; Carter, Cushing, Clark, & Kennedy, 2005). Ultimately, the vast majority of paraprofessional studies focus on five key areas: skills, job fulfillment, roles, preparation, and relationships. This research is succinctly summarized below.

Skill and expertise. Research indicates paraprofessionals often lack important teaching skills, formal education, and hands-on experience (Bolton & Mayer, 2008). Additionally, studies have shown that paraprofessionals are attracted to the job hours and benefits, but they are often underpaid (Conway, Rawlings, & Wolfgram, 2014; Johnson, 2016). This generally lures less qualified applicants to the profession (Brown & Stanton-Chapman, 2014). To combat this problem, the No Child Left Behind Act (2002) established minimum qualifications for paraprofessionals by requiring Title I schools to comply with federal restrictions (Nichols, 2013). This included: obtaining a high school diploma, passing a standardized exam, and completing 30 college credits (Nichols, 2013). However, many school systems are forced to hire candidates who do not meet these requirements due to lack of applicants and low job desirability (Appl, 2006). Additionally, while several studies have alluded to the need for extensive experience and education for paraprofessional success (French, 2003; Picket & Gerlack, 2003), other findings revealed paraprofessional supports can be beneficial despite their level of education or prior experience (Jones & Bender, 1993; Giangreco et al., 2001). Regardless of these conflicting findings, paraprofessionals of all skill and experience levels often leave the profession due to low job fulfillment (Giangreco, Doyle, & Suter, 2012).

Job fulfillment. The majority of paraprofessional research occurs in the area of job fulfillment. In a survey of 19 paraprofessionals, Brown and Stanton-Chapman (2014) discovered that the majority of paraprofessionals did not feel they were fairly compensated for their work, had no opportunities for advancement, and had limited job contentment (Brown & Stanton-Chapman, 2014). Moreover, it is well documented that paraprofessionals often receive minimal pay (Conway, Rawlings, & Wolfgram, 2014; Johnson, 2016; Katsiyannis, 2000). In addition to monetary compensation, professional fulfillment is often influenced by classroom roles and obligations and varies among paraprofessionals in different settings (Giangreco, Doyle, & Suter, 2012). Specifically, paraprofessionals feel they are required to take on too many tasks (e.g., leading small groups, planning lessons, enforcing rules and procedures) leaving them unsatisfied with their job (Broer, Doyle, & Giangreco, 2005; Brown & Stanton-Chapman, 2014).

Classroom roles and obligations. Paraprofessional tasks and classroom obligations can drastically vary based on geographical location. While some classrooms and school systems require paraprofessionals to lesson plan, to help with curriculum development, and to assist with

behavioral issues, others use paraprofessionals in a supplemental role to ‘aid’ the teacher in the classroom (Appl, 2006; Broer, Doyle, & Giangreco, 2005). In many instances, the classroom teacher is responsible for delegating specific roles and obligations (Appl, 2006; Giangreco, Smith, & Pickney, 2006). In other cases, paraprofessional obligations are vague and unsupervised (Giangreco, Smith, & Pickney, 2006). One study found that almost 70 percent of paraprofessionals in special education inclusive classrooms reported they made decisions without asking the lead teacher for advice (Giangreco & Broer, 2005). These ambiguous job descriptions and unclear roles make it difficult to adequately train, coach, and prepare all paraprofessionals similarly (Armstrong, 2010).

Job preparation and coaching. With regards to job preparation and coaching, several studies found paraprofessionals receive little training on a variety of classroom responsibilities (Armstrong, 2010; Tarry & Cox, 2013). Teachers and paraprofessionals often feel unprepared for some of the academic and social demands of working with students (Armstrong, 2010). This is especially evident for paraprofessionals who work with children with disabilities (Allen & Ashbaker, 2004). Research suggests that there are benefits to providing training and coaching opportunities to paraprofessionals (Jones et al., 2012). Specifically, several single subject studies provide evidence that adequately trained paraprofessionals have a positive impact on classroom relationships (Rueda & Monzo, 2002) and student engagement (Abbot & Sanders, 2012). However, training does not always happen. Brown and Stanton-Chapman (2014) found that the majority of paraprofessionals did not receive adequate classroom training with more than half of the paraprofessionals reporting they received no training within the last year. This lack of preparation can cause discontentment in the classroom and impact classroom relationships.

Relationships with teachers and students. Research recognizes paraprofessional relationships as critical to the overall classroom environment (Blalock, 1991; Downing, Ryndak & Clark, 2000). Paraprofessionals work intimately with teachers, administrators, students and their families, often forming close relationships with all parties (Blalock, 1991; Burgess & Mayes, 2009). The nature of these relationships is often affected by paraprofessionals’ perceived appreciation and job satisfaction. Brown and Stanton-Chapman (2014) found this to be true in their recent study of paraprofessional perspectives. Specifically, when paraprofessionals were asked if their classroom teacher made clear expectations for them, 21 percent (n=4) strongly agreed, 37 percent (n=7) agreed, 26 percent (n=5) disagreed, and 16 percent strongly disagreed (n=3). Theoretically, research dating back to 1985 has indicated the critical need for teachers and paraprofessionals to work as a team, thus confirming the importance of positive classroom relationships (Bennett, Deluca, & Bruns, 1997; Downing, Ryndak, & Clark, 2000; Lacattiva, 1985).

Multiple Perspectives

With each of these key areas taken into consideration, a recent systematic review of paraprofessional relationships with teachers, students, and families revealed only 10 out of 28 studies (36%) explored more than one perspective in a study—that is, studies either focused on one particular issue or on the views of teachers, paraprofessionals, and students individually (Brown, 2016). This means 18 of the 28 (62 percent) studies reported one-sided interpretations and understandings of paraprofessional interactions and did not get reports from both sides about classroom issues. Specific to teacher and paraprofessional relationships, sixteen total studies

were retrieved and only two (Chopra & French, 2004; Giangreco, Smith, & Pickney, 2006) reported perspectives from the teacher and paraprofessional (Brown, 2016). Instead, fourteen studies relied solely on the relationship perspective from the paraprofessional and did not include confirming or conflicting views from the teachers. This omission is important because researchers could not compare reports from both sides to corroborate or refute paraprofessional statements.

Of the two studies that looked at both teacher and paraprofessional views, Giangreco, Smith, & Pickney (2006) found that teachers reported very different ideas of classroom relationships than their paraprofessionals and both indicated these interactions were often strained due to varying expectations, roles, and responsibilities. Chopra & French (2004) looked at paraprofessional and teacher relationships with parents to determine the extent of communication involved with both parties. Findings revealed that paraprofessionals and teachers viewed communication with parents very differently, and teachers interacted less frequently but in a much more professional, and less personal, context than paraprofessionals (Chopra & French, 2004).

Overall, limited research involved sustained time in the field with the purposes of exploring the nuanced relationships between teachers and paraprofessional and what this looks like in classroom settings (Armstrong, 2010). Very few studies utilized methodology that allowed researchers to explore relationships over a sustained period of time in order to make assertions about teacher and paraprofessional dealings (Armstrong, 2010; Brown & Stanton-Chapman, 2014). An in-depth exploration of the perspectives on the paraprofessional and teacher relationship from the viewpoints of both paraprofessional and teacher is missing from the literature and can offer useful insight into how administrators and teachers can best support the hiring, training, support, and retention of paraprofessionals (Lewis, 2004).

Current Study

The current study extends a study conducted by Brown and Stanton-Chapman (2014) by using a qualitative case study design to examine the relationship between paraprofessionals' perspectives of skills, job responsibilities, training, relationships, and satisfaction and teachers' perspectives of these same ideas. Findings from the Brown and Stanton-Chapman (2014) study indicate there is a difference between paraprofessional and teacher perspectives, but the study did not investigate these views for a sustained amount of time (more than 20 hours). The current study addresses this by thoroughly exploring compounding views of teacher and paraprofessional jobs. Most importantly, it will also fill a gap in the research by comparing multiple perspectives, on the five key areas of paraprofessional research, from teachers and paraprofessionals. The following research questions were addressed:

- (1) What are the skills, experiences, training, and responsibilities of paraprofessionals and teachers, and how does this impact job satisfaction and classroom relationships?
- (2) To what extent are these interpretations shared, or not shared, across teachers and paraprofessionals?
- (3) How do paraprofessionals relate to themselves, classroom teachers, students, and the

school community, in narrative re-tellings and through structured observations?

Conceptual and Theoretical Framework

The present study is informed by both narrative theory (Gibson, 1996) and symbolic interactionism (Blumer, 1986). The interviews arise from narrative theory, or the understanding that humans are rational beings and find meanings in their stories (Andrews, Squire, & Tambokou, 2008; Trahar, 2013). Narratives are a way for persons to make meaning of their unique experiences. In research, this allows for methodical examination of the construction of a participants' stories and responses. In this study, paraprofessional and teacher narratives about their experiences will provide insight into how they make meaning of their respective roles with regards to five key themes: a) skill and expertise, b) job fulfillment and satisfaction, c) classroom roles and obligations, d) job preparation and coaching, and e) overall classroom relationships.

In addition to narrative theory, the study is framed by the theory of symbolic interactionism, which serves as a purposeful lens to examine paraprofessional and teacher identity as well as the formation of interactions among these groups (Blumer, 1986). Symbolic interactionism relies on three premises: (1) human beings use meanings they make to act upon certain occurrences or objects, (2) these meanings arise from the social interactions humans have with one another, and (3) these meanings are handled in an interpretive process "used by the person in dealing with the things he encounters" (Blumer, 1969, p. 2). A major component of symbolic interactionism emphasizes that human actions result from their individual interpretation of objects and proceedings surrounding them (Blumer, 1969). In the case of paraprofessionals and teachers, these parties serve as active agents who interpret their environment and respond and behave accordingly. In this study, symbolic interactionism shaped the researchers understanding of how paraprofessionals and teachers interpreted and made meaning of the five common themes in the literature: skills/experience, job fulfillment, roles and obligations, preparation and coaching, and relationships with teachers and students (Brown & Stanton-Chapman, 2014).

Methods

A qualitative case study design was used to investigate the perspectives of paraprofessionals and teachers on multiple issues including: skills and expertise, preparation and training, job fulfillment, roles and obligations, and overall classroom relationships. The qualitative method was selected because the phenomenon to be reviewed includes complex human interactions between the teachers and paraprofessionals (Peterson & Spencer, 1993). Additionally, Klingner and Boardman (2011) note that many studies in special education do not utilize the correct methods to capture "complicated issues faced in schools" (p. 208). As with all case study research, the goal of this study is to deeply understand the boundaries of the case and the intricacy of the behavior patterns of the bounded system (Stake, 1995). In this instance, the bounded system includes the preschool paraprofessionals and teachers in one school system in a mid-Atlantic state.

Participants and Context

This study was conducted in eight preschool classrooms across one rural county in Western Virginia. The school district contains 11 elementary schools, three middle schools, and five high schools with a total enrollment of approximately 10,500 students. Ninety-three percent of the school population is White, five percent is Black or African American, and the remaining two percent is comprised of Latino, Asian-American, and American Indian students.

The sample consisted of eight paraprofessionals and the eight teachers they directly worked with. The classroom and participants were selected based on proximity to the researcher's location and because a previous study was conducted in a neighboring school district (Brown & Stanton-Chapman, 2014).

Table 1

Paraprofessional and Teacher Demographics

Paraprofessional	Age	Race	Education	Years Experience	Teaching Partner
Jessica	51	W	High School CDA	4	Carla
Lisa	57	W	Child Development Associate	16	Amy
Sandra	48	W	Associate	30	Melissa
Rebecca	47	W	BA - Business	6	Hailey
Hannah	50	W	Some college	24	Catherine
Tonya	25	W	Associate	4	Brittany
Sally	45	W	High School CDA	9	Chelsea
Jennifer	34	W	Associate	6	Martha

Teacher	Age	Race	Education	Years Experience	Teaching Partner
Carla	26	W	Master's	4	Jessica
Amy	31	W	Bachelor's	10	Lisa
Melissa	34	W	Master's	2 teacher 4 para	Sandra
Hailey	50	W	Master's	10	Rebecca
Catherine	32	W	Master's	10	Hannah
Brittany	37	W	Master's	10 – teacher 5 - para	Tonya
Chelsea	38	W	Master's	14	Sally
Martha	32	W	Master's	5	Jennifer

Data Sources and Analysis

Data collection concentrated on perspectives of both the teachers and the paraprofessionals who worked directly with them, in their classroom. The objective was to understand both perspectives in order to make assertions and ultimately create overall themes from the settings. In addition to case study methodology, narrative inquiry, as described above, was used to “impose order on the flow of experience to make sense of events and actions” (Riessman, 1993, p. 2). Narrative theory helped the researchers utilize direct conversations and interview transcripts in order to make sense of the observed events and actions. Data were collected through: a) classroom observations; b) semi-structured interviews; and c) document collection.

Classroom observations. A total of 24 classroom observations were conducted (three in each of the eight classrooms). The observations lasted for a total of one hour each, or 24 total hours of observation and were conducted by two researchers in the eight classrooms. Overall, the observations took place over the course of two months and were conducted equally before, during, and after interviews of the participants. During observations, both researchers documented what they saw through detailed field notes in a spiral notebook that were later transcribed. To focus the observations, a detailed observation protocol was established. The researchers also generated post-observation analytic memos that detailed “interpretations, methodological notes, observation notes, theoretical assertions, and high- and low-level inferences” (Brown & Stanton-Chapman, 2014). These analytic memos served to inform the researchers on specific questions or actions to observe the next time they entered a classroom.

According to Schwandt (1997), in qualitative inquiry, reliability “is an epistemic criterion thought to be necessary but not sufficient for establishing the truth of an account or interpretation of a social phenomenon” (p. 137). To establish reliability, Researcher One served as the primary coder and observed in each classroom twice, for a total of 16 hours, and then again in four of the classrooms a third time, for an overall total of 20 hours. Researcher Two, for agreement

purposes, observed in four of the eight classrooms twice, for a total of four hours. The two researchers then analyzed the data in order to jointly agree on four common themes or assertions. It is important to note, according to Harris, Pryor, and Adams (2006), these assertions are “general in nature” and reliability comes in the form “that two credible researchers or research teams studying the same or similar contexts will generate consistent overall result patterns, and any variance between result sets will be traceable to documented changes in informants and/or researchers” (p. 9). Additional information on validity criteria are further explained in the data analysis section.

Interviews. After concluding observations, eight paraprofessionals and eight teachers were interviewed with a pre-determined interview protocol informed by themes emerging from observations in conjunction with the five common themes drawn from the extant literature. Researcher One designed two discrete interview protocols (one for the teachers and one for the paraprofessionals) in order to obtain multiple perspectives. Each interview lasted approximately one hour, for a total sixteen hours of interview.

Table 2
Sample Interview Questions

Skill/Expertise
• Describe your educational background: High school/College
Job Fulfillment
• Overall, describe your level of satisfaction with your job responsibilities.
Classroom Roles and Obligations
• What are the responsibilities outlined in your contract?
Job Preparation and Coaching
• What type of training did the you receive before taking this job? (i.e. college training, specific courses, etc.)
Relationships with Teachers and Students
• Explain the importance of having a good relationship with your assistant. What impact does this have on you/him or her/the classroom/and the students?

Document collection. Document collection consisted primarily of the school system’s preschool handbook. The handbook is 253 pages and covers all aspects of instruction, responsibilities, relationships within all parties in the preschool program, etc. The handbook specifically covers how to build family partnerships, how to work as a team, procedures for instructional guidance, and necessary forms and other components of the preschool program. In addition to the handbook, several other documents were collected including lesson plans with designated roles and daily instructional notes voluntarily provided by three teachers and four paraprofessionals.

Data Analysis

The same two researchers who conducted the classroom observations conducted the qualitative data analysis. Researchers used naturalistic and interpretive research to seek out meanings of participants. Expressly, this study aimed to gain an understanding of classroom relationships and interactions that took place in eight preschool settings (Erickson, 1986). The data consisted of observations, field notes, the researcher’s analytic journal, interview transcriptions, and gathered documents. Researchers explored ongoing qualitative data from the interpretivist paradigm and used the method of analytic induction (Erickson, 1986). Specifically, investigators engaged in an

iterative and recursive process where data was continually collected, analyzed, and themes were generated from emerging assertions. Analytic induction, in this sense, was used to form systematic evaluations of social phenomena surrounding the paraprofessionals, and teachers, to develop concepts, ideas, and assertions. Quotations from observations, transcribed interviews, and analytic vignettes were used to illustrate the confirmation of events and validate assertions. A reflective journal was kept to provide trustworthiness for the study in what way?(Stake, 2005).

Qualitative analysis used the following five steps, adapted from Erickson (1986) and Znaniecki (1934): (1) Investigators created a definition of a happening and used this to generate an assertion (i.e. Teachers and paraprofessionals share similar classroom responsibilities). (2) Researchers reassessed observations notes, document collection, and interview data to verify or disprove the assertion. (3) If the assertion was not verified, the investigators examined ways to alter the original assertion. (4) Researchers reviewed supplementary interviews, document collections, and observational notes to facilitate adding additional evidence to the new assertion. (5) Ultimately, when an assertion was not substantiated, the investigators found added information to make a new assertion until there were no data unaccounted for. Furthermore, the same two researchers examined the data and assertions to jointly agree on the collective themes. This process, using triangulation, corroborated the evidence from both researchers, all of the data, and established validity (Creswell, 2002; Stake, 2005). After an assertion was confirmed by evidence, it was called a theme.

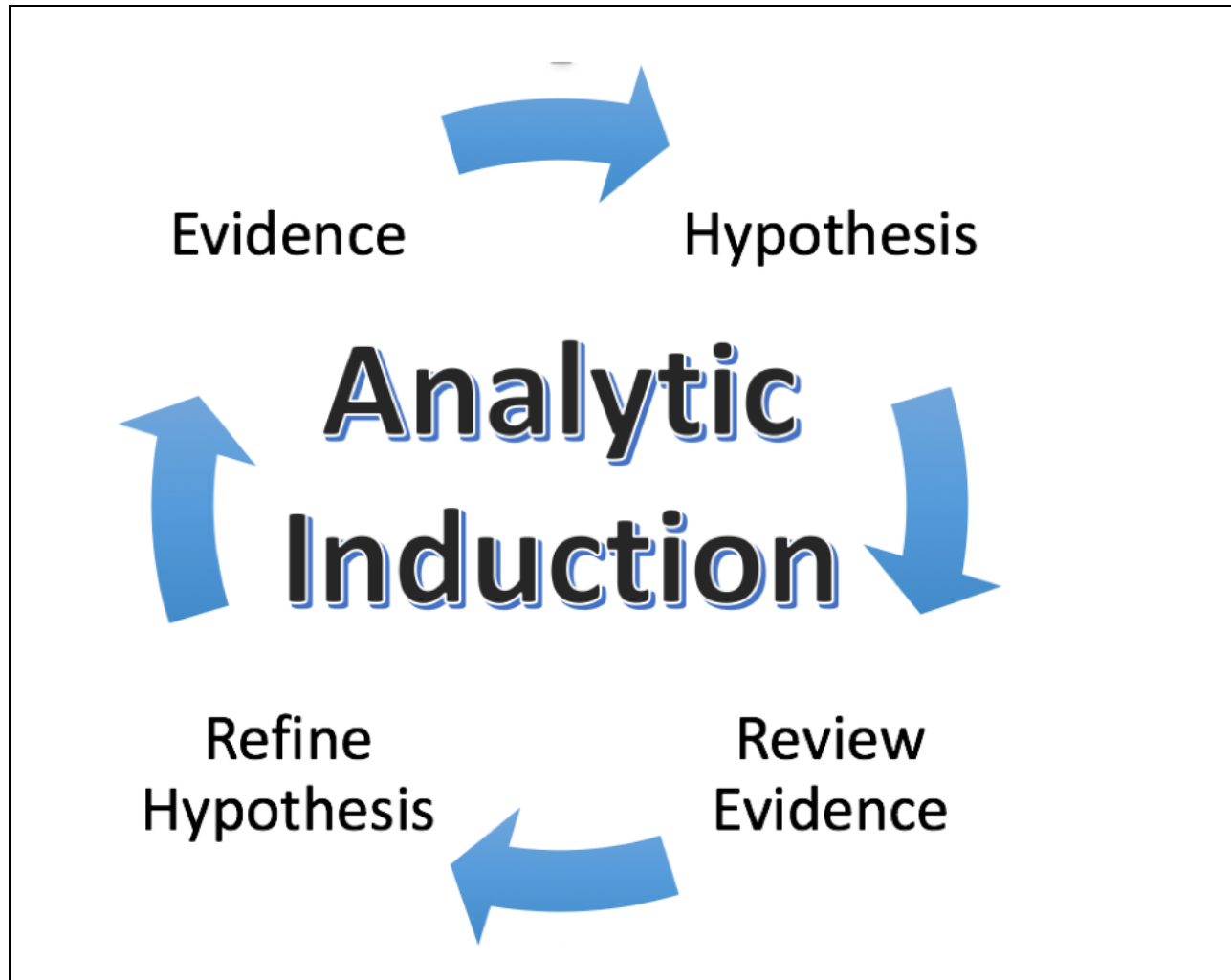


Figure 1: Analytic Induction from Erickson (1986). This figure represents a visual representation of the analytic induction process.

Findings

Findings revealed four themes based on interviews, observations, and document analyses. The themes generated in this study were compiled and presented in relation to topics in prior literature and investigated with multiple perspectives in mind. The four themes highlighted (a) the responsibilities and motivation of paraprofessionals in competition with the receptiveness of teachers, (b) the ways in which paraprofessional behaviors assimilate to mimic teacher behaviors, (c) the mismatch between displayed recognition and appreciation from the teacher, and perceived recognition and appreciation by the paraprofessional, and (d) the governing influence that school, district, and regional policies have on individual classroom outcomes and relationships.

Theme 1: Responsibilities, Motivation, and Receptiveness

Teachers and paraprofessionals share similar classroom responsibilities. There is a direct connection between paraprofessional motivation (willingness to engage in specific tasks) and teacher receptiveness (willingness to relinquish responsibilities to paraprofessionals).

Classroom roles, responsibilities, and interactions are often determined by lead teachers and passed on to paraprofessionals. Lead teachers can either be receptive to help with instruction and classroom interactions or be hesitant to relinquish control. On the other side, paraprofessionals may display strong motivation to become involved in classroom activities, or he or she may require more support and take less initiative. The interchange between these two parties often influences many aspects of the classroom environment.

Table 3

Examples of the Dual-Connection between Paraprofessional (P) Motivation and Teacher (T) Acceptance/Receptiveness

	High P Motivation	Low P Motivation
High T Receptiveness	T says in an interview of P, "The way our system works, she pretty much does everything I do. It's great and really helpful. The kids treat us the exact same." (Interview with Teacher 3)	During center time, T asks P if she wants to help lead an art activity. P responds, "No. I'm not really good with crafts. You know that." (Observation in Classroom 5)
Low T Receptiveness	P asks if it is acceptable to begin another story because her group finishes before T's group. T responds, "You stick to the schedule. Just wait." (Observation in Classroom 4)	T becomes agitated in an interview and says of the P, "I don't want her to do anything because she doesn't know how to do it anyway. Plus, she's fine just sitting on her butt, so that's one thing we agree on." (Interview with Teacher 1)

The above table illustrates four examples of the interchange among paraprofessional motivation and teacher receptiveness to responsibilities. As described in Brown and Stanton-Chapman (2014), motivation is defined as a "paraprofessional's willingness to perform classroom tasks" (p. 6). Receptiveness is defined as "the teacher's willingness to relinquish control and allow the paraprofessional to complete classroom tasks" (Brown & Stanton-Chapman, 2014, p. 6). In the occurrence of high teacher receptiveness and high paraprofessional motivation, Mrs. Hailey, emphasized the importance of mutual communication and collaboration. "She pretty much does everything I do. It's great and really helpful," said Mrs. Hailey. Mrs. Hailey also made a point to illustrate the positive impact this had on the students in the classroom by stating they treated her and her paraprofessional "The exact same." (Interview, 4/12/16).

An example of the exact opposite of this interchange can be seen in a teacher with low receptiveness and a paraprofessional with low motivation. Mrs. Chelsea became very agitated when discussing her relationship with the paraprofessional. She made multiple comments about how the paraprofessional "Doesn't know how to do it anyway" and she does not "want her to do

anything.” (Interview, 3/22/16). These remarks were reinforced during a separate classroom observation illustrated in the following vignette:

The students return from specials (art today) and enter the room quietly in a single-file line. Sandra leads the line. As everyone arrives, Mrs. Melissa asks the students to sit on the farm-themed carpet. Sandra immediately retreats to chair in the back corner of the room. Mrs. Melissa begins to ask the students what they did in art, how their weekend was, and other introductory morning questions. One student, who is having trouble sitting still, stands up and walks to the back corner of the room which is adjacent to Sandra. Sandra does not acknowledge him but instead picks up a magazine and begins flipping the pages. Mrs. Melissa carries on with her questioning of the children and then notices the stray student. She appears slightly irritated and says, “Steven. Get back to the carpet.” Sandra briefly looks up from her magazine, rolls her eyes, and then continues to read.

Steven retreats to the rug. He places both hands in the air and begins to wave them around. Only two students look at him. Mrs. Melissa keeps reading. Suddenly Steven begins making animal noises. He snorts like a pig several times and uses his index finger to turn up the tip of his nose (seemingly imitating a pig). Mrs. Melissa glances at Sandra. She is still reading her magazine. Steven, continuing to make the pig noise, starts to get the attention of at least five students. Mrs. Melissa politely asks him to, “Please be quiet during story time.” Sandra again briefly looks up from her magazine, smiles, and lets out a small chuckle. (Observation, 2/23/16).

In this vignette, the paraprofessional, Sandra, made no attempt to assist when a student displayed inappropriate or distractive behavior. Similarly, Mrs. Melissa made no attempt to engage Sandra in the classroom activity or ask for her assistance in managing the behavior. This is an observed example of the paraprofessional displaying low motivation while the teacher simultaneously displays low receptiveness to paraprofessional support.

The two other types of relationships are low paraprofessional motivation coupled with high teacher receptiveness and high paraprofessional motivation coupled with low teacher receptiveness. As seen in Table 4, there is a conflict when a paraprofessional displays low motivation but the teacher is receptive to help. For example, in an observation, Mrs. Brittany (the teacher) asked Tonya (the paraprofessional) to help lead an art activity. Tonya responded with, “No. I am not really good at crafts. You know that.” (Interview, 4/5/16). Conversely, in another observation, the opposite was witnessed. In this case, the paraprofessional (Hannah) asked her teacher (Mrs. Catherine) if she could begin another story when her group finished their book. Mrs. Catherine immediately responded, “You stick to the schedule. Just wait.” (Observation, 3/2/16). In this instance, although the paraprofessional took initiative, the teacher was not receptive to her help. Ultimately, this theme of motivation and receptiveness has an impact on the classroom relationship and can be seen in Theme Two.

Theme 2: Relationships and Demeanor Assimilation

Paraprofessionals often assimilate to match the lead teacher’s demeanor and perspectives. A power dynamic exists between the teacher and paraprofessional which causes the paraprofessional to work not only to please the teacher, but the paraprofessional may actually

take on some of the personality traits displayed by the teacher. This is more commonly visible in classrooms where teachers and paraprofessionals have worked with one another for longer periods of time.

Analogous to Theme One, the interchange between paraprofessional motivation and teacher receptiveness often leads to the formation of the relationship power dynamic in the classroom. Specifically, teacher-paraprofessional relationships can be significantly influenced by the paraprofessional's attitude and demeanor. Some paraprofessionals, especially those who have worked with a teacher for a long time, tend to “act” like and take on personality characteristics of the lead teacher in the classroom. When this happens, teachers can either be receptive or non-receptive.

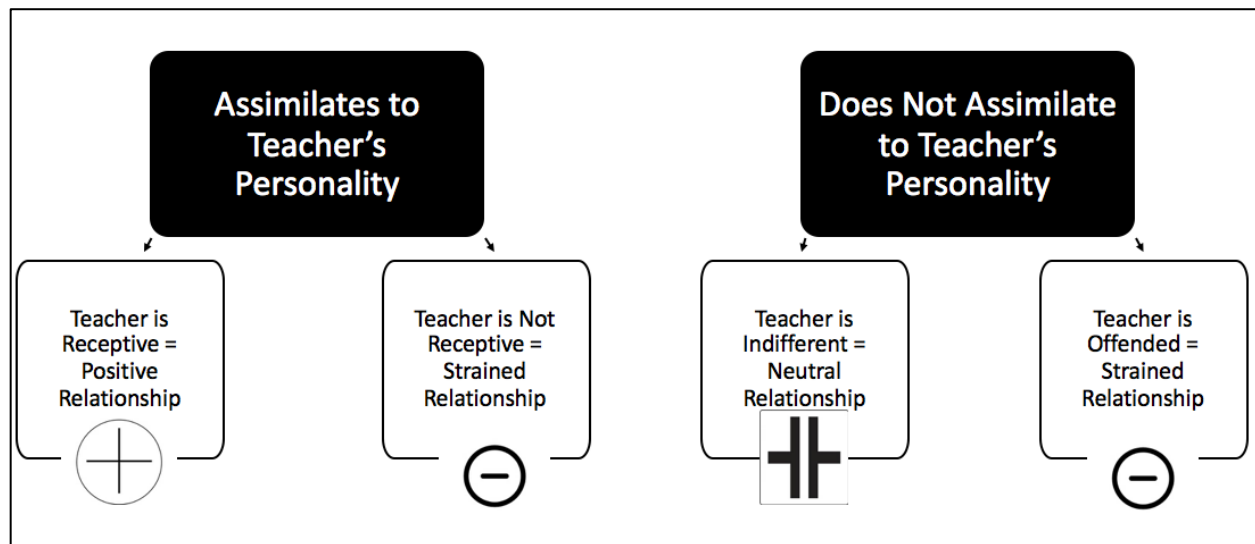


Figure 2. Personality Assimilation. This figure illustrates paraprofessional assimilation to teacher demeanor and personality.

This figure can be further supported through classroom observations and interviews. The following vignette is an example of a paraprofessional, Sally, who tries to assimilate to the teacher's personality by taking on similar views:

The students are engaged in center time. Some are playing with blocks, trains, and barn animals while others are enjoying the art area or water table. A group of three girls play house and have a small disagreement over who should be the “mom” and who should be the “baby”. Mrs. Chelsea sits with two boys, near the art center, to demonstrate the vocabulary word of the day -- “huffing”. The boys giggle as Mrs. Chelsea uses various objects (sand, paper, cotton, and wood) to see if they move by simply blowing on them. Sally is in the opposite corner of the room helping a student navigate ABCmouse on the computer.

A visitor comes in and speaks with Sally. The visitor says, “Wow. It must be a full moon or something because the kids are off the wall.” Sally smiles and says, “I know! I thought the same thing.” The visitor leaves. Minutes later Sally walks up to Mrs. Chelsea and says, “Is it a full moon?” Mrs. Chelsea quickly replies, “Why? I don’t believe in that. It is

not researched-based.” Immediately Sally says, “Oh, I know. Me neither. It’s just a dumb thing people say.” (Observation, 3/2/16).

This vignette represents one example of a paraprofessional agreeing with or assimilating to the teacher’s beliefs. Sally mentioned how “knowledgeable” Mrs. Chelsea is and how they “agree on everything.” (Observation, 3/2/16). This as a strong example of a positive relationship between the paraprofessional and teacher with mutual respect and veneration. In this instance, the paraprofessional is proud of sharing similar qualities with the teacher, and the teacher is receptive to this assimilation. This idea was confirmed with this specific teacher and paraprofessional pair in a subsequent interview with Sally where she mentioned she feels “fortunate to have such a great teacher as a role model.” (Interview, 3/22/16). In a separate interview Mrs. Chelsea commented she is “proud of how Sally is turning into such a great educator” thus confirming this assimilation is seen as positive among both parties. (Interview, 3/22/16).

A very different view of this demeanor assimilation can be seen in Mrs. Catherine’s classroom. In this setting the researcher witnessed Hannah, the paraprofessional, attempt to “get along” with Mrs. Catherine on a personal level. During a candid discussion at the playground Hannah made several comments to the teacher about how they both liked the same television shows and lived in the same area. One comment was made about “hanging out outside of work.” (Observation, 3/2/16). Mrs. Catherine just smiled and nodded and did not reply to this request. In a subsequent interview Mrs. Catherine told the researcher it can be “frustrating” when Hannah spends too much time “trying to please me” and less time “focusing on her job responsibilities.” (Interview, 4/5/16).

Additional comments from three paraprofessionals through interviews and observations include:

- “I just follow her lead. She went to school, so I assume she is right.” (Interview, 4/5/16).
- “People say I’m a lot like her (teacher). Do you see it?” (Interview, 4/21/16).
- “We tend to get along because we do things the same. Sometimes the kids get us confused.” (Interview, 3/22/16).

These comments illustrate varying views from multiple paraprofessionals but reflect there may be some form of power dynamic which results in the paraprofessional adjusting their opinion and perspectives to meet teacher needs. Perhaps this is why, in some cases, the paraprofessional tries to take on the role of the teacher’s personality in order to “fit in” and get along. Overall, these classroom relationships often impact recognition and appreciation, as demonstrated below in Theme Three.

Theme 3: Multiple Views - Mismatch Between Displayed Recognition/Appreciation and Perceived Recognition and Appreciation

Teachers and paraprofessionals have contrasting views on several factors including what constitutes appropriate recognition and appreciation. While teachers often state they value paraprofessionals this appreciation is often not “seen” or obvious to paraprofessionals. Contrastingly, paraprofessionals often feel undervalued, overworked, and undercompensated.

Paraprofessional contentment as a result of both responsibilities (Theme One) and relationships (Theme Two) repeatedly revolves around the concept of recognition and appreciation. These lines become blurred when a paraprofessional does not perceive he or she is respected or appreciated, but the teacher feels he or she is demonstrating outright appreciation. In many instances teachers may believe that their appreciation is noticed when it is often actually undetected by the paraprofessional. Additionally, these paraprofessionals internalize this lack of appreciation causing them to feel devalued and overtasked. Examples of both of these outcomes were present during this study and are described below.

Views from teachers. In conversations with the teachers, seven of the eight made a point to discuss their display of appreciation for the paraprofessional in their classroom. Specifically, Mrs. Catherine stated she often gave “gifts” to show her appreciation. (Interview, 4/5/16). In a conversation with Mrs. Amy she mentioned she “enjoyed working” with her paraprofessional and felt she did a “good job” showing it. (Observation, 2/4/16). Additional comments from the teachers through interviews and observations include:

- “I always tell her thank you. Even if we don’t have time to talk, I just make sure I say at least that.” (Interview, 3/22/16).
- “Every Friday we order lunch. Sometimes I’ll offer to pay for hers. She doesn’t always accept, but I just want her to know she’s valued.” (Interview, 4/12/16).
- “Yea, I think she knows how thankful I am to have her. We have a very challenging class, and I wouldn’t be able to get all of these things done if she wasn’t here.” (Interview, 4/5/16).

Views from paraprofessionals. In interviews and candid conversations with the paraprofessionals only three outwardly reported the teacher engaging in positive affirmation for their work, making statements like “She is encouraging,” “She lets me know when I do something correctly,” and “She always compliments how hard I work.” (Interview, 4/12/16). The other five assistants displayed very different views. For example, Rebecca stated she “got along” with her cooperating teacher but she never really felt like there was a “mutual respect” or “connection.” (Interview, 4/12/16). Similarly, during a candid conversation, Sally discussed how she works extremely hard for the teacher, school, and students and “nobody seems to care.” (Interview, 3/22/16). Additional comments from the paraprofessionals include:

- “I kind of just do what I’m told. She doesn’t really say much.” (Interview, 4/12/16).
- “I think she does like having me here, but she isn’t really good at showing it. It’s just her personality, I guess.” (Interview, 4/21/16).
- “I think getting more appreciation from her would make the job a lot more fun. I love the kids but sometimes I feel like that’s not enough.” (Interview, 4/5/16).

Due to these competing views, the primary researcher decided to candidly ask one paraprofessional and lead teacher the same question. This pair were chosen for further examination because both the teacher and paraprofessional were very open with their interview responses previously and the researcher wanted to know if different views would be displayed. The question and corresponding answers can be seen in Figure 3. As demonstrated, while the teacher felt she showed appreciation for her assistant through a formal Christmas gift, the

assistant did not even remember receiving the gift. Instead, she remembered the teacher did not directly thank her for support in the classroom. This is a robust example of the mismatch between the displayed recognition and appreciation from the teacher and the perceived recognition and appreciation from the paraprofessional. This relationship dynamic was also influenced by school configuration and policies, as seen in Theme Four.

Question: Did you two do anything for each other for Christmas? If so, what?		
	Teacher Response	Paraprofessional Response
	"I spent a lot of time thinking about what to get her. She is kind of funny about receiving presents, but I wanted her to know she was thought of, so I just got her some candy. She loves candy."	"I got her a candle, but I can't remember if she got me anything. Maybe food? I don't know. I didn't really want a present but a card saying 'Thank You' would have been nice."

Figure 3: Comparing Views. This figure represents comparing views, between the teacher and paraprofessional, on the same question of recognition and appreciation.

Theme 4: Governing Influence by School Configuration and Policies

While classroom relationships are often impacted by paraprofessional-teacher relationships, school and district policies greatly influence classroom outcomes. Individual teacher choice and freedom is first and foremost affected by institutional governing policies. Therefore, instruction and interactions between paraprofessionals, teachers, students, and families may vary based on different school system policies.

Despite the above themes relating to appreciation, relationships, and responsibilities, teachers and paraprofessionals are often at the mercy of their school system. Specifically, district policies often dictate the curriculum (Werts, Harris, Tillery, & Roark, 2004), expectations (Drecktrah, 2000), and policies (Riggs & Mueller, 2001). This means that different school systems may alter paraprofessional-teacher and paraprofessional-student relationships based on their own policies. While some schools may require paraprofessionals to take more of a “back seat” to the teacher, and serve as a supplementary or supportive role, other systems require paraprofessionals to take on very similar roles and responsibilities.

For this study, researchers accessed, through document collection, the school system’s preschool handbook. A component of the handbook shows little difference between teacher and paraprofessional roles. For example, many sections state the teacher and paraprofessional are responsible for the same obligations. Table 4 illustrates an example of these similarities. Additionally, the handbook discusses the importance of parallel collaboration between all members of the instructional team. Table 5 is just one of many examples of how paraprofessionals and teachers in this district are viewed as equal entities with a common goal for student success.

Table 4

Example of Similar Teacher and Paraprofessional Responsibilities from the Preschool Handbook

- *Participates appropriately in planning/delivering instructions*

The assistant will help the teacher plan for the daily schedule, changes in the daily schedule, theme based instruction, and individual differences.

The assistant will deliver teacher created objectives with individuals, small group, and whole group. Examples:

- ✓ The assistant will help the teacher plan for his/her role in the daily schedule during the following times of the day: unloading buses, breakfast, transitions, group time, tooth brushing, center time, large motor time, lunch, rest, and the closing of the day.
- ✓ The assistant will understand and help provide support during changes in the day such as early dismissals, special activities and assemblies.
- ✓ The assistant will help the teacher implement a teacher planned class theme; help with centers, individual work, small group, and whole group. The assistant may be asked to make teacher directed materials to support the class theme.
- ✓ The assistant will help the teacher deliver planned activities such as read aloud observations, art, reading to students, assisting students in library, writing dictations given by students, helping students locate and use materials, assisting students to follow and understand directions, encouraging students to work independently, and listening to students.

Table 5

Demonstration of Paraprofessionals and Teachers as Equal in the Preschool Handbook

Social/Emotional Development As teachers and teaching assistants, we want the preschool children in our classrooms to demonstrate school readiness by reaching the following goals: (Preschool Staff developed these goals) • Independence • Lifetime learners • Positive outlook on life • Believe they can do it • Self Confidence • Contribute to community • Respectful • Problem solving skills • Responsible • Be their best • Be risk takers • Express themselves comfortably • Self control • Feel safe and loved
--

This district-level policy was easily observed in the classrooms, as well. An example is displayed in the following vignette:

Mrs. Carla quickly arranged the classroom for the read-aloud. She placed two of the same books, *The Three Little Pigs*, in separate areas of the room. Just as she did this, Jessica arrived with the students. They entered the classroom, one by one, and Mrs. Carla said, “Ok. Those in my group come on over!” Seven students walked and calmly sat down on the carpet in front of Mrs. Carla. The remaining eight students walked to the other side of the room, along with Jessica, and sat on a round carpet in front of her. Then, Mrs. Carla and Jessica began to talk.

Mrs. Carla said, “How many of you have ever been to a farm?” The students enthusiastically raised their hands or shouted, “Me!” Across the room, Jessica could be heard saying, “Have any of you ever been to a farm?” The students shouted and exclaimed, “I have!” Next, Mrs. Carla asked, “Do you know what your house is made out of?” Almost simultaneously, Jessica, talking to her group, asked, “What materials are your homes made from?” After these questions, Mrs. Carla and Jessica each read the book to their respective groups, with both stopping at similar times for discussion and extension activities. (Observation, 3/10/16).

This vignette is an example of the district policy in action. For example, the Division for Early Childhood (DEC) created a policy document to help bridge the gap between research and practice, by providing guidance to all stakeholders involved in the education of young children. Part of the policy on teaming collaboration states the following:

The quality of the relationships and interactions among these adults affects the success of these programs. Teaming and collaboration practices are those that promote and sustain collaborative adult partnerships, relationships, and ongoing interactions to ensure that programs and services achieve desired child and family outcomes and goals (DEC Recommended Practices, 2014, p. 14)

In this instance, the paraprofessional took on the same role as the teacher when it came to this academic task. Additionally, there was evidence of collaboration and mutual understanding because the teacher and paraprofessional led the group instruction very similarly, including asking the same extension and discussion questions. This lends itself directly to a policy in the handbook, shown in Table 5.

Discussion

In this study, paraprofessional and teacher views were investigated in order to discover answers to important questions on skills/expertise, job fulfillment, roles and obligations, preparation and training, and classroom relationships. Furthermore, this study expanded on previous research by using an in-depth approach to include multiple perspectives on classroom experiences. Overall, the findings support existing paraprofessional research in these five domains (e.g., Giangreco et al., 2012).

Skills/expertise. Collective data analyses offered added points to the extant literature. First, research emphasizes the role of the classroom teacher as a supervisor to the paraprofessional (Appl, 2006). Teachers commonly have higher levels of education and are put into supervisory roles based on expertise (Nichols, 2013). While this is the case in many schools, analyses from this study revealed that district, regional, state, and national policies actually have a larger impact on classroom dealings than teacher supervision. It was noted that while several systems may ask paraprofessionals to serve in a supportive role to the teacher, other schools require paraprofessionals to take on additional classroom roles. In this study, the school system investigated set forth a specific policy treating paraprofessionals and teachers as equals. Although the teacher was still the “supervisor,” she was not treated with more respect in the classroom than the paraprofessional with less education. Both were equivalent members in the classroom and expected to perform similar classroom duties including supervision, discipline, and instruction.

Preparation and coaching. Similar to skills/expertise, extant research identified paraprofessional education and experience as the major influencing factors on job performance (Bolton & Mayer, 2008). Brown & Stanton-Chapman (2014) discovered that motivation, on both the part of the teacher and paraprofessional, actually played a larger role than formal education and training or coaching. This follow-up study confirmed Brown and Stanton-Chapman’s (2014) findings, in Theme One by recognizing that educational levels and training had little impact on classroom performance but rather “a bigger influence was the ability or inability of the paraprofessional to engage in classroom responsibilities coupled with the desire or unwillingness of the teacher to relinquish control in her classroom” (Brown & Stanton-Chapman, 2014, p. 10). This theme was seen again in the current study as both teachers and paraprofessionals viewed the motivation of the paraprofessional as more important than their previous experience or levels of training. Specifically, the current study found that teachers who allowed

paraprofessionals more freedom and autonomy reported higher levels of successful classroom relationships and outcomes than those teachers who allowed less flexibility. This finding was in contrast to previous studies that documented the lack of training as the major impacting factor for classroom success (Carter, O'Rourke, Sisco, & Pelsue, 2009; Frith & Lindsey, 1982).

Job fulfillment. Next, several previous studies discuss the negative impact of minimal pay for paraprofessionals (Appl, 2006). Additionally, Brown and Stanton-Chapman (2014) found that while paraprofessionals feel underpaid, teachers do not always feel paraprofessionals deserve more compensation. In this study, reports from paraprofessionals and teachers alike indicated that both parties are underpaid. While previous research alluded to this as a more pressing issue in paraprofessional research (Brown & Stanton-Chapman, 2014; Katsiyannis, 2000), this study showed that policies, specifically in this Mid-Atlantic region, have made it difficult for pay advances for all members of the school community no matter their job title. Perhaps more importantly, evidence from Theme 3 revealed this fulfillment is also more likely to be impacted by non-monetary compensation and appreciation. While teachers often felt they demonstrated recognition and appreciation for their assistants/paraprofessionals, the paraprofessionals saw these displays of recognition very differently and often felt under-appreciated while over-utilized for classroom tasks. Findings from interviews and observations revealed this mode of appreciation was more significant and discussed more frequently than monetary compensation.

Roles and obligations. Similarly, document collection and observation revealed a strong indication that higher officials hold an important influence on all aspects of classroom interactions. Particularly, while teachers often supervise paraprofessionals and dictate their responsibilities, this changes from location to location based on the flexibility and autonomy allowed by each school system. This was further revealed in Theme 4 where the district policy had a larger impact on all aspects of classroom dealings than simply teacher or paraprofessional discretion. In this study, teachers and paraprofessionals had very specific duties outlined in a handbook. This finding is consistent with previous research that outlines national, state, and district policies for paraprofessionals (Armstrong, 2010; Katsiyannis, 2000), but it places an added emphasis on the importance of structured requirements for paraprofessionals and notes these requirements vary from location to location.

Classroom relationships. Finally, the issue of classroom relationships was revealed in all themes. Theme 1 was consistent with Brown and Stanton-Chapman's (2014) research findings. In this theme, researchers found that responsibilities, motivation, and receptiveness impact all aspects of the classroom including curriculum and student contentment. More specifically, when teacher receptiveness is coupled with paraprofessional motivation a dynamic exists that can drastically change classroom occurrences. Additionally, a second finding in the relationship domain was revealed in Theme 2 and included an interesting component on teacher-paraprofessional relationships relating to a power-dynamic. Consistent with previous literature, paraprofessionals and teachers often form close relationships due to their work proximity (Blalock, 1991; Burgess & Mayes, 2009). Explicitly, the current study found this to be true and also found many paraprofessionals, who are often under-trained and under-educated, attempt to assimilate to the teacher's position and demeanor in order to positively impact the overall classroom atmosphere.

Limitations and Directions for Future Research

This study is not without limitations. First, the majority of this study relied only participant's self-reported data. Although, there is a growing body of work emphasizing the validity of self-reported data (Kuncel, Crede, & Thomas, 2005), researchers paid particular attention to responses that occurred from selective memory (omitting experiences in memory), telescoping (recalling events at the wrong time), attribution (attaching positive events to personal success and negative events to external factors), and exaggeration (embellishing responses and events) (Brutus, Aguinis, & Wassmer, 2013). Also, triangulation of data was used to combat validity concerns. Despite the awareness of these issues, it is simply not possible to independently verify each interview respondent's answers.

Second, the overall sample was not demographically diverse. All observation and interview participants were white, female, and ranged in age from 25 to 51. Additionally, the study was conducted in one rural school district in the Mid-Atlantic region. Although findings may contribute to the literature and provide further insight into paraprofessional issues, they cannot be generalized outside of the population and specific bounded system.

With those limitations delineated, future research should emphasize three areas: First, further studies should use larger, more defined and diverse samples. While this study expanded on a previous investigation, future research should continue to explore these same questions with a larger sample size, a different geographical region, and differentiated demographic specifications. Second, future research should explore both case studies and larger survey studies in order to get more in-depth qualitative analysis from case studies and more evidence for statistical comparison in larger survey studies. Third, further research should be conducted on outcomes for schools that utilize paraprofessionals and teachers in different ways, particularly distinguishing between schools that follow or do not follow DEC Standards (DEC Recommended Practices, 2014). Finally, additional research should be conducted on the interplay of these findings including paraprofessional-teacher relationships in multiple settings and the influence of culture and varying demographic categories on these interactions.

Practice and Policy Implications

These findings have considerable implications for policy-makers and stakeholders in U.S. school systems. This study provides preliminary evidence of different perspectives among paraprofessionals and teachers across almost all domains mentioned in the public-school setting. Throughout the course of the interviews and observations, findings were revealed that could have practice implications, in four primary areas: (a) responsibilities, motivation, and environment, (b) relationships and demeanor assimilation, (c) mismatch between displayed recognition/appreciation and perceived recognition/appreciation, and (d) governing influence by school configuration and policies.

Responsibilities, motivation, and environment.

Research notes that paraprofessional and teacher responsibilities vary from location to location (Appl, 2006; Brown & Stanton-Chapman, 2014). In this study, although teachers reported higher levels of education and job training compared to their direct paraprofessionals, interview and

observational data confirmed that this was not mentioned as an impacting factor for classroom duties. Specifically, teachers and paraprofessionals both made multiple mentions of the impact that motivation and enthusiasm had on classroom activities. There were only two instances where paraprofessionals stated they did not have adequate education to perform the same duties as teachers. With this in mind, policy makers could consider additional factors that contribute to classroom outcomes. Although the United States government has attempted to require paraprofessionals to earn more educational requirements through No Child Left Behind and Title 1 restrictions there are other factors that influence classroom performance (Nichols, 2013). Additionally, according to Katsiyannis (2000), “Credentialing systems are not widespread, and in most cases paraeducators are untrained personnel who are often employed for economic, political or logistical reasons” (p. 303). Taking this into account, policy-makers should look for other ways to determine the impact paraprofessionals have on classroom occurrences (i.e. inclusion, student outcomes, instruction, and discipline) and provide meaningful ways to allocate resources and establish hiring and supervisory procedures.

Relationships and demeanor assimilation.

Secondly, extant research has looked at the ways that paraprofessionals interact with their supervisors and teachers and noted that working in close proximity often influences many aspects of the classroom environment (Blalock, 1991; Burgess & Mayes, 2009). In the current study, researchers found that paraprofessionals often assimilate to teacher behaviors in order to “please” or “succumb” to teacher demands. This has important implications for policy as school systems may want to look at “who” is a paraprofessional, why they chose the position, and what attracts them to this occupation. Additionally, this relationship between teachers and paraprofessionals has important research implications to consider and explore which types of relationships provide the best outcomes for students in the classroom.

Mismatch between displayed and perceived recognition and appreciation.

Thirdly, this study was among the first to look at multiple perspectives from teachers and paraprofessionals on classroom issues, particularly in the preschool setting. While existing research recognizes many paraprofessionals and teachers are attracted to the profession based on hours and benefits, there is also evidence to show low job desirability based on pay (Appl, 2006). Additionally, research recognizes that paraprofessionals often leave due to low job fulfillment (Giangreco, Doyle, & Suter, 2012). Little is known about the rates of paraprofessionals that leave the occupation based on both monetary and non-monetary compensation. Findings from this study highlighted that paraprofessionals and teachers often perceive recognition and appreciation differently. Many paraprofessionals in the study reported low levels of recognition and appreciation from their supervising teacher. Contrastingly, teachers perceived they adequately recognized and showed appreciation for the paraprofessional in their classroom. This finding alone has policy implications for two reasons. First, these outcomes may indicate a need for teacher sensitivity or awareness training in order to provide recognition and support that is desired from the paraprofessionals. Second, school systems may better service their teachers and paraprofessionals and promote job satisfaction by surveying their needs, fulfillment, and desirability for retention.

Governing influence by school configuration and policies.

Finally, the majority of policy implications from this study lie in the governing influence by school configuration and policies. It is important to mention that national, state, district, and local policies all impact classroom operations. Findings from this study indicated paraprofessional and teacher roles, responsibilities, and even overall contentment were based on the district policies outlined explicitly in a handbook. Research has shown that these policies vary based on location (Brown & Stanton-Chapman, 2014; Nichols, 2013). With this in mind, there are important implications for varying school systems to decide in which ways they wish to utilize their personnel. This has practice and policy implications for all areas to determine which schools are most successful in distinctive domains (i.e. discipline, academics, job retention) based on their use of personnel. Practice may improve if these groups adopt anti-deficit model attitudes and assume that each party has a stake in creating a positive environment and enhancing educational and social outcomes for all children (Song & Pyon, 2008).

In conclusion, more research is needed on paraprofessional roles, contentment, education, and training. This situation is of concern because paraprofessionals work closely with teachers and students but are utilized in many different ways. A few concluding questions that emerge from the data presented in this study include: (a) How can schools best utilize paraprofessionals and teachers collectively? (b) What comprises effective training and education levels for paraprofessionals given their diverse job requirements? (c) How can teachers and administrators plan for successful classroom outcomes while utilizing paraprofessionals in varied settings?

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***Video Modeling to Support Physical Activity in Children with Autism Spectrum Disorder:
A Systematic Review***

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Abstract

The purpose of this systematic review was to examine the literature on video modeling to support physical activity in children with autism spectrum disorder (ASD). Specific aims were to (1) identify the targeted skills and behaviors of interest, (2) identify the type of video modeling procedure implemented, and (3) examine the effects of video modeling. This review was guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA). Search procedures, eligibility criteria, and data extraction were defined a priori to the study protocol. Results indicated the most widely used modeling procedure was basic video modeling. Targeted skills and behaviors included aquatics, dance, motor skills, video gaming, physiological responses, and verbal complimenting. This systematic review found video modeling to be a promising intervention to support physical activity in children with ASD. However, it is suggested for future research to provide even more consistency, clarity, and rigor in the design, implementation, and monitoring of the intervention.

Keywords: Autism Spectrum Disorder, Physical Activity, Systematic Review, Video Modeling.

***Video Modeling to Support Physical Activity in Children with Autism Spectrum Disorder:
A Systematic Review***

According to the Physical Activity Guidelines for Americans - second edition (U.S. Department of Health and Human Services [USDHHS], 2018), participation in physical activity is an important step one can take to improve their overall health and reduce risks of chronic diseases. The guidelines outline the recommended amount, type, and intensity level of physical activity across various age groups and populations (USDHHS, 2018). While it is essential to educate all people on the importance of physical activity, it is especially important to educate and support populations who traditionally engage in minimal physical activity. Such populations include children with autism spectrum disorder (ASD) who often fall short of the recommended guidelines for physical activity (Bandini et al., 2013; Borremans et al., 2010; Gehricke et al., 2020; MacDonald et al., 2011; McCoy & Morgan, 2020; Obrusnikova & Cavalier, 2011; Pan et al., 2016; Stanish et al., 2015). Furthermore, studies have shown this population to have deficits and delays in motor development (Downey & Rapport, 2012; Paquet et al., 2016; Van Damme et al., 2015). Based on these findings, it is necessary to identify evidence-based practices to support physical activity in children with ASD.

To date, approximately 1 in 54 children (age 8 years) in the United States has been diagnosed with ASD (Maenner et al., 2020). ASD is a developmental condition characterized by impairments in social communication and interaction, along with restricted and repetitive behaviors (Diagnostic and Statistical Manual of Mental Disorders (5th ed.; DSM–5; American Psychiatric Association, 2013). While there has been considerable focus on the core features of ASD (i.e., social communication and interaction), a growing body of literature has directed its attention to the levels of physical activity of this population (Bandini et al., 2013; Borremans et al., 2010; MacDonald et al., 2011; Pan et al., 2016).

In a comparison study of parent-reported physical activity levels among 53 children with ASD and 58 typically developing (TD) children ages 3-11 years, children with ASD engaged in fewer physical activities and for less time compared to TD peers (Bandini et al., 2013). In a cross-sectional study of children with ASD, Pan et al. (2016) compared 35 school-aged males with ASD to 35 school-aged males without ASD (ages 12-17 years). The results showed that males with ASD were less physically active overall, spent less time engaged in moderate-to-vigorous physical activity (MVPA), and scored significantly lower on various measures of physical fitness (i.e., cardiovascular endurance, strength, and flexibility) compared to TD peers. Similar findings were reported in adolescents with ASD. Borremans et al. (2010) compared physical fitness profiles and activity levels of 30 adolescents with ASD to 30 adolescents without ASD. Results showed that adolescents with ASD were less physically active and scored significantly lower than the comparison group on physical fitness measures (i.e., cardiovascular endurance, speed, muscular strength, flexibility, balance, and coordination) than peers without ASD. Using a large sample size, Gehricke et al. (2020) examined data derived from the Autism Treatment Network Registry Call Back Assessment and the National Survey of Children's Health (NSCH). The results of this investigation showed males with ASD (ages 6-11 years) to engage in physical activity less often than peers in the NSCH general population.

Furthermore, in a cross-sectional study of 72 children with ASD, MacDonald et al. (2011) compared the physical activity patterns of 72 children with autism by age groups. Forty-two children with ASD, ages 9-11 years, were compared to 30 children with ASD, ages 12-18 years. Results found significant differences between the mean time spent in MVPA and the mean time spent in sedentary activity. Older children with ASD, ages 12-18 years, were significantly more physically inactive than younger children with ASD ages 9-11 years (MacDonald et al., 2011). Lower levels of physical activity in children with ASD compared to TD children may be due to perceived barriers.

Using a convenience sample of 12 males and 2 females with ASD ages 8-14 years, Obrusnikova and Cavalier (2011) identified several barriers to, and facilitators of after-school participation in MVPA. The most notable perceived barriers were technology (i.e., video games, computer, TV, music), lack of a peer exercise partner, lack of time by the parents, inclement weather, lack of or unsafe equipment, lack of transportation to physical activity programs, and homework. The most notable perceived facilitators were playing individual/dual sports, playing Wii Sports/Fit, having friends and parents who are supportive or physically active, direct exercise equipment (e.g., bike, scooter), supportive exercise equipment (e.g., sneakers, fan), and the availability of physical activity programs, parks, and playgrounds within the community (Obrusnikova & Cavalier, 2011).

While perceived barriers could certainly inhibit physical activity, enjoyment levels may also contribute to the engagement in physical activity. In a comparison study of 35 adolescents with

ASD to 60 TD adolescents, Stanish et al. (2015) found significantly fewer adolescents with ASD enjoyed team sports and physical education compared to the TD adolescents. A greater proportion of adolescents with ASD perceived physical activities were difficult to learn, and fewer adolescents with ASD believed that physical activity was a way to make friends. In addition, fewer adolescents with ASD preferred physical activity during their free time. Even though some adolescents with ASD felt that physical activity was fun, the proportion was lower than the TD group. The study concluded that adolescents with ASD would more likely experience enjoyment and success in physical activity when they are provided a choice of activities, specially-designed instruction and supports that combined technology with physical activity. As reported by Deci and Ryan (1985), an important component of natural enjoyment is the feeling of competence in one's ability. Therefore, it may be necessary to focus on the motor competency of this population as well.

According to the Society of Health and Physical Educators (known as SHAPE America), “. . . motor competency is essential for participation in physical activity and for health-enhancing fitness” (SHAPE America, 2014, p. 6). Furthermore, according to the Individuals with Disabilities Education Act, the law requires special education, including physical education, to provide specially-designed instruction to meet the unique needs of children with disabilities (Individuals with Disabilities Education Act [IDEA], 2004). Under the definition of special education, IDEA (2004) has defined physical education as, “The development of (a) physical education and motor fitness, (b) fundamental motor skills and patterns, and (c) skills in aquatics, dance, and individual and group games and sport (including intramural and lifetime sports)” (IDEA, 2004, Section 300.39 Special Education). Both IDEA (2004) and the newly implemented Every Student Succeeds Act of 2015 have acknowledged the importance of health, nutritional education, physical activity, and structured physical education programs for all students (SEC. 4108. Activities to Support Safe and Healthy Students, Every Student Succeeds Act [ESSA], 2015).

Video Modeling

To date, the National Professional Development Center on Autism Spectrum Disorder has identified 28 evidence-based practices to support children with ASD. One of the 28 evidence-based practices is video modeling (Steinbrenner et al., 2020). Video modeling is an instructional strategy in which a video demonstration of a targeted skill or behavior is presented to the learner via a media device (i.e., computer, laptop, or tablet). The learner observes the modeled event and attempts to replicate the skill or behavior. Model types used in the video could be a peer, sibling, adult, or a self-model (Steinbrenner et al., 2020). The National Professional Development Center on Autism Spectrum Disorder has identified four types of video modeling procedures to support this population. They include: (a) basic video modeling, a technique in which a peer, sibling, or adult model demonstrates a targeted skill or behavior; (b) video self-modeling, a technique in which the learner observes themselves successfully performing a targeted skill or behavior; (c) point-of-view modeling, a technique in which a video recording is taken from the first-person perspective (i.e., the hands of the model are shown manipulating materials to complete a task); and (d) video prompting, a technique in which each step of a targeted skill is recorded. Pauses are built into the video to allow time for the learner to complete one step before viewing subsequent steps (Steinbrenner et al., 2020).

Video modeling has long been used by teachers, coaches, and physical educators to facilitate motor skill development and participation in physical activity. For example, studies have shown

video modeling to be effective in the acquisition of the overhand throw (Doussoulin & Rehbein, 2011), fundamental basketball skills (O'Loughlin et al., 2013), track and field events (Panteli et al., 2013), diving (Rymal et al., 2010), and gymnastic performances (Bouazizi et al., 2014; Ste-Marie et al., 2011a; Ste-Marie et al., 2011b). While video modeling has shown to support physical activity in children with typical development, little is known on the effects of video modeling to support physical activity in children with ASD.

However, studies have shown video modeling to be effective in teaching children with ASD an array of life skills such as, “. . . play skills, language skills, self-help skills, social communication skills, functional daily living skills, academic skills, and appropriate behaviors” (Cardon, 2016, p. 90). Based on these findings, the purpose of this review was to examine the current literature on the use of video modeling as it relates to physical activity (e.g., motor skill development, fitness, sport, aquatics, dance) for children with ASD. More specifically, the aims of this study were to: (1) identify the targeted skills and behaviors in which video modeling was used, (2) identify the types of video modeling procedures implemented, and (3) examine the effects of video modeling.

Method

This systematic review was guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) standards (Moher et al., 2009). The following procedures were defined a priori in the study protocol.

Search Strategy

The following electronic databases were used in this systematic review: (a) Academic Search Complete, (b) Child Development and Adolescent Studies, (c) CINAHL, (d) Educational Research Complete, (e) Educational Resources Information Center, (f) Physical Education Index, (g) Psychology and Behavioral Sciences, (h) SPORTDiscus with Full Text, and (i) Web of Science. All database searches included the following identifiers: For ASD (*autism* OR “*autism spectrum disorder*” OR *asd*); AND physical activity (“*physical activity*” OR “*physical education*” OR “*motor skills*” OR *exercise* OR *fitness* OR *athletics* OR *sport* OR *aquatics* OR *dance*); AND video modeling (*video* OR “*video modeling*” OR “*video self-modeling*” OR “*point of view*” OR “*video prompting*”). Titles and abstracts of studies retrieved from the search were further reviewed to determine eligibility criteria.

Eligibility Criteria

To be included in this systematic review, studies were required to meet the following eligibility criteria: (a) included participants with autism spectrum disorder, (b) indicated the use basic video modeling, video self-modeling, point-of-view modeling, or video prompting, (c) involved participation in physical activity, physical education, motor skills, exercise, fitness, athletics, sport, aquatics, or dance, (d) included children and adolescents between ages 3-21 years, (e) published between 2010 to 2019, (f) retrieved from a peer-reviewed scholarly journal, and (g) written in English.

Data Extraction

Studies identified in the systematic review are summarized accordingly: (a) first author and year of publication; (b) number of participants, (c) age of participants, (d) purpose of the study, (e) modeling procedure (e.g., video modeling, self-video modeling, point-of-view video modeling, or video prompting), (f) research design, (g) dependent variables, and (h) findings.

Results

The initial search of this systematic review resulted in 94 studies from nine databases. Listed in alphabetical order, the nine databases yield the following: Academic Search Complete ($n = 15$); Child Development & Adolescents Studies ($n = 6$); CINAHL ($n = 2$); Education Research Complete ($n = 10$); Educational Resources Information Center ($n = 8$); Physical Education Index ($n = 1$); Psychology and Behavioral Science Collection ($n = 5$); SPORTDiscus ($n = 4$); and Web of Science ($n = 43$). Upon removal of duplicates ($n = 46$), 48 studies were screened for eligibility. After further examination of the titles and abstracts, 38 studies did not meet the eligibility criteria and were excluded from the review. Ten studies were systematically reviewed by text. One study was excluded from the review, as the text was not available in English. As a result, nine studies met the predetermined eligibility criteria and were included in the systematic review. For a visual illustration of the selection process, see Figure 1.

Flow Chart

Video Modeling to Support Physical Activity in Children with ASD

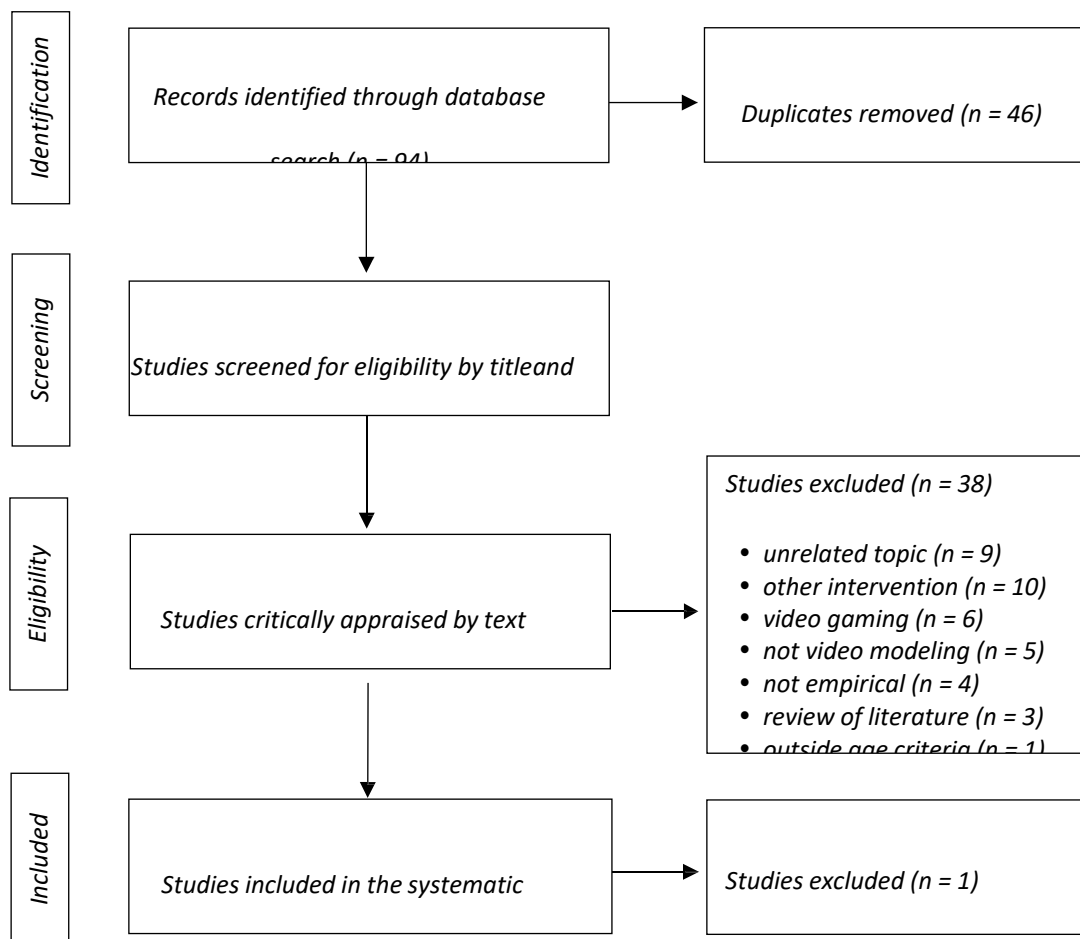


Figure 1. PRISMA Flow chart of the study selection process (Moher et al., 2009).

The nine studies selected for this review included eight different first authors and were published between the years 2012 to 2019. A total of 104 participants (ages 3-17 years) were included in this review. As for gender, 66%, ($n = 69$) of the participants were male, 5% were female ($n = 5$), and 29% were not identified as either male or female ($n = 30$). Of the participants, 62.5%, ($n = 65$) were diagnosed with ASD, and 37.5%, ($n = 39$) were identified as typical developing (TD). With regards to research design, single-case design was the most common, 66.7% ($n = 6$); this was followed by experimental design, 33.3% ($n = 3$).

Targeted Skills and Behaviors of Interest

The first aim was to identify the targeted skills and behaviors of interest. The results of this investigation indicated that motor skill development (i.e., locomotor and object control skills) was most common 33.3%, ($n = 3$); this was followed by aquatic skills (i.e., back crawl and aquatic play skills) 22.2%, ($n = 2$); and 11.1%, ($n = 1$) for each of the following targeted skills and behaviors, physiological responses to physical activity (i.e., energy expenditure and heart rate); line dancing (i.e., the Cupid Shuffle), video gaming (i.e., basic skills), and verbal complimenting during an athletic game.

Type of Video Modeling Procedure

The second aim of this investigation was to identify the type of video modeling procedure implemented. The results indicated that basic video modeling was the most common procedure 66.6%, ($n = 6$). This was followed by video prompting 22.2%, ($n = 2$) and video self-modeling 11.1%, ($n = 1$). The only video modeling procedure not represented in this review was point-of-view modeling, a technique in which a video recording is taken from the first-person perspective.

Effects of Video Modeling

The third aim of this investigation was to examine the effects of video modeling. Overall, the studies found video modeling to support motor skill development and participation in physical activity in children with ASD. With regards to basic video modeling, 5 of the 6 studies reported video modeling to be an effective intervention to support children with ASD. For example, in a study of six participants with ASD (ages 5-10 years), Bittner et al. (2017) examined the effects of basic video modeling to facilitate the physiological responses to physical activity. The results indicated significant increases in peak energy expenditure and heart rate response during the performance of locomotor skills. Leonard (2018) also examined the effects of basic video modeling with two participants (ages 13 and 16 years) with ASD. The results of the study indicated basic video modeling supported the acquisition of the back crawl swim stroke, as shown by improvement in body positioning and arm and leg movements.

In an investigation of five participants with ASD (ages 9-11 years), Macpherson et al. (2015) examined the effects of basic video modeling to increase verbal compliments after watching video modeled demonstrations of the behavior during athletic play. The results indicated that basic video modeling supported verbal complimenting during participation in an athletic game. In a comparison study of 48 males with and without ASD (ages 9-13 years), Taheri-Torbati and Sotoodeh (2019) examined the effects of basic video modeling on learning motor skills (i.e., underhand throw). Results from this study indicated that both live modeling and video modeling supported motor skill acquisition. Similarly, in a comparison study of 27 participants with and

without ASD (ages 3-16 years), Yun and Case (2016) examined the effects of basic video modeling on the acquisition of fundamental motor skills. While there were no significant differences, it was reported that the participants performed better after using the basic video modeling procedure. In an investigation of 6 participants with ASD (ages 5-9 years), Bittner et al. (2018) examined the effects of 3 interventions (i.e., picture task cards [PTCs], basic video modeling, or a combination of the two protocols). The results from this investigation indicated no functional relationship between the interventions and the motor skill performance of the participants with ASD.

With regards to video prompting and video self-modeling procedures, researchers reported favorable outcomes. For example, Gies and Porretta (2012) examined the effects of video prompting to support the acquisition, maintenance, and generalization of the Cupid Shuffle line dance. The results indicated that video prompting was effective in teaching the Cupid Shuffle to 2 participants with ASD (ages 12 and 17 years). Similarly, Yanardag et al. (2013) found video prompting to be effective in teaching aquatic play skills to 2 males and 1 female (ages 6-8 years). As for self-video modeling, Kurnaz and Yanardag (2018) examined the effects of the procedure with 4 participants with ASD (age 7 years). The results indicated that self-video modeling was effective in teaching active video game skills to all four participants. As previously noted, point-of-view video modeling was not represented in this review (see Table 1).

Table 1

Description of studies examining video modeling to support physical activity in children with ASD

First author (year)	Number of participants	Age	Purpose of the study	Modeling procedure	Research design	Dependent variable	Findings
Bittner et al. (2017)	6 5m / 1f	5-10 years	To examine the effect of practice-style teaching methods to an exercise app to facilitate physiological responses to PA (locomotor and object control activities) via continuous measurements of energy expenditure and heart rate.	Basic video modeling (model type not defined)	Experimental research design	Average and peak energy expenditure (METs); average and peak heart rate (bpm) during PA (locomotor & object control) and type of instruction.	No statistical differences in average energy expenditure and average heart rate across conditions and type of PA. However, there were significant increases in peak energy expenditure and peak heart rate response for locomotor skills while using the app.
Bittner et al. (2018)	6 5m / 1f	5-9 years	To determine the effect of three types of instructional strategies PTCs, VM, or a combination of protocols on the FMS of children with ASD.	Basic video modeling (model type not identified)	Single-case Randomized alternating treatment combination design.	TGMD-3 locomotor and object control skill scores.	No functional relationship between PTCs, VM, or a combination of protocols and motor performance was seen in children w/ ASD.
Gies et al. (2012)	2 2m / 0f	12,17 years	To examine the effect of VP as an intervention for the acquisition, maintenance, and generalization of a line dance to adolescence w/ASD.	Video prompting (adult model)	Single-case Multiple probe design.	A task analysis of the Cupid Shuffle dance.	Video prompting was effective in teaching the Cupid Shuffle dance.
Kurnaz et al. (2018)	4 3m / 1f	7 years	To examine the effects of VSM on teaching active video game skills.	Video self-modeling	Single-case Multiple probe design with probe conditions across subjects.	Percentage of correct responses to a 25-step task analysis of teaching active video game skills.	Found VSM was effective in teaching active video game skills to all four participants w/ASD.
Leonard (2018)	2	13,16 years	To examine the effects of teaching the back crawl swim stroke to children w/ASD using video modeling and physical prompting.	Basic video modeling with physical prompting	Single-case A-B design w/ multiple probe conditions.	Number of correct and attempted arm strokes during the back crawl swim stroke.	VM and physical prompting improved body position and arm and leg movements in the back crawl swim stroke.

Note. ASD - autism spectrum disorder; BPM - beats per minute (heart rate); FMS - fundamental motor skills; METs - metabolic equivalent (energy expenditure); PA - physical activity, PTCs - picture task cards; TGMD-3 - Test of Gross Motor Development-3rd Edition; TD - typical developing; VM - video modeling; and VSM - video self-modeling.

Table 1 (*continued*)*Description of studies examining video modeling to support physical activity in children with ASD*

First author (year)	Number of participants	Age	Purpose of the study	Modeling procedure	Research design	Dependent variable	Findings
Macpherson et al. (2015)	5 4m / 1 f	9-11 years	To examine the effects of a portable video modeling intervention delivered in the natural environment on verbal compliment and gestures demonstrated by five children with ASD.	Basic video modeling (adult model)	Single-case Multiple baseline design across participants.	Number of verbal compliments and compliment gestures during an athletic game (i.e., kickball).	Verbal compliments increased after watching a VM demonstration of the targeted behavior.
Taheri-Torbati et al. (2019)	48 m 24 ASD / 24 TD	9-13 years	To examine the effects of video modeling and live modeling on learning motor skills in children with ASD.	Basic video modeling	Repeated measures: group (ASD, TD) x condition (live, video) x block (pre, post, retention).	Kinematic data regarding the coordination of the underhand throwing motion.	No significant main effect for conditions. All groups performed better in the post-test and in the retention-test. Live modeling & video modeling both are beneficial in teaching motor skills.
Yanardag et al. (2013)	3 2m / 1f	6-8 years	To investigate the effect of video prompting on teaching aquatic play skills; and to examine the effects of aquatic exercise training on the motor performance of children with ASD.	Video prompting (peer model)	Single-case Multiple probe design across behaviors & replicated across the subjects. Percentage of correct steps in the three aquatic play skills.	All participants increased in the percentage of steps completed correctly, and aquatic exercise training enhanced the motor performance scores of all participants in the study.	Video modeling was effective in teaching aquatic play skills to children w/ASD.
Yun et al. (2016)	28 13 ASD / 15 TD	3-16 years	To examine the effects of video modeling on the FMS of children with ASD.	Basic video modeling	Repeated measures: (ASD, TD) x protocol (video traditional) x test (pre, post).	TGMD-3 to measure motor skills.	Children w/ ASD performed better after video modeling, however, not significantly.

Note. ASD - autism spectrum disorder; BPM - beats per minute (heart rate); FMS - fundamental motor skills; METS - metabolic equivalent (energy expenditure); PA - physical activity, PTCs - picture task cards; TGMD-3 - Test of Gross Motor Development-3rd Edition; TD - typical developing; VM - video modeling; and VSM - video self-modeling.

Discussion

According to the National Professional Development Center on Autism Spectrum Disorder, video modeling is one of the 28 evidence-based practices shown to support children and adolescents with ASD (Steinbrenner et al., 2020). This systematic review examined the current literature on the use of video modeling as it relates to physical activity among children with ASD. Video modeling was found to be used primarily to support motor skills. This finding is important due to motor skills being an area of concern among children with ASD.

Pan (2014) analyzed motor skills and fitness of adolescence with ($n = 31$) and without ($n = 31$) ASD. Participants with ASD scored significantly lower among motor and fitness measures than TD. Similarly, Liu et al. (2014) analyzed motor skills among children with ASD ($n = 21$) to their peers ($n = 21$) using the TGMD-2 (Ulrich, 2000). Findings revealed the children with ASD performed significantly lower ($p < .01$) than their TD peers. Case and Yun (2018) also found children with ASD scored low on the Test of Gross Motor Development, Third edition (TGMD-3; Ulrich, 2019). Results suggest children with ASD may have low motor skills. There is a need to support their motor skill development through interventions, such as video modeling.

Video modeling was found to be an effective method to support physical activity behaviors among children with ASD in this systematic review. Similarly, Kellems et al. (2018) found video modeling to support motor behaviors such as throwing, walking backwards, and performing jumping jacks more than verbal instructions and a picture. However, video modeling may not always increase motor skill performance more than a live demonstration. Case and Yun (2018) analyzed children with ASD ($n = 13$) performance of the TGMD-3 (Ulrich, 2019) through live demonstration and video modeling conditions. While participants performed slightly better through observing a video model, this was not significant ($p > .05$). Similarly, Taheri-Torbati and Sotoodeh (2019) found children with ASD performed statistically equal in the underhand throw after they observed a live or video model. Since performance increased from baseline to the retention test in both conditions, video modeling may be an equally effective method to teach the underhand throw to a live demonstration. Results suggest video modeling to be a helpful strategy to support physical activity and motor skills among children with ASD.

Limitations

Findings from this current systematic review showed video modeling to be a promising intervention to support physical activity in children with ASD. However, there were several limitations of this review. For example, only nine studies were deemed admissible to the review, the studies resulted in a small sample size, most of the participants were male, several participants were not identified as either male or female, and the video modeling procedures varied in research design, implementation, model type, and targeted skills and behaviors. While additional research is warranted, there are several recommendations and suggestions for future research.

Recommendations for Future Research

One, it is recommended for future research to include more descriptive information about the participants (i.e., age, gender, IQ, ASD severity level, adaptive behavior measures, and motor ability). Participant information would provide information regarding the usefulness of video modeling for a variety of children with ASD. For example, younger children may rely on

rehearsal strategies when an older child is able to learn from observing a video, and boys may benefit from a model more than girls (Ste-Marie et al., 2012). ASD severity may also impact the ability to replicate an observed actions from a video model (Cardon, 2013). Providing detailed information about the participants could support the knowledge in implementing video modeling as a means to support physical activity among children with ASD.

Two, it is recommended for future research to include a description of the model type (i.e., male, female, adult, peer, self, and skill level). Following a review of literature, Ste-Marie et al. (2012) presented factors such as observer/participant characteristics and model characteristics that impacted learning outcomes related to observing a live or video model. Research specific to ASD also revealed that peer models of the same age and gender, as the participant, led to higher learning outcomes (McCoy & Hermansen, 2007). Results may be due to children being able to identify with models that are similar in age and gender.

Three, it is recommended for future research to provide step-by-step instructions on the design and implementation of the video modeling procedure (i.e., video duration, number of video presentations, and the type of media device used to deliver the targeted skill or behavior). Research has revealed factors such as the screen size, use of verbal narrative, and free from distractions have altered learning outcomes among children with ASD (Cardon, 2016). Thus, it has been recommended to follow specific steps prior to creating a video model, regardless of video modeling type.

More consistency, clarity, and rigor in the design, implementation, and monitoring might allow researchers to replicate and systematically evaluate the effectiveness of video modeling in children with ASD. Resources such as the Autism Focused Intervention Resources and Modules (AFIRM Team, 2019) would be of value to researchers and practitioners. The online resource provides step-by-step instructions on the design, implementation, and monitoring of the EBPs identified by the National Professional Development Center (AFIRM Team, 2019). These resources and modules may support consistency within video modeling to support physical activity behaviors among children with ASD. In addition to the recommendations, there are several suggestions for future research.

According to Judge and Morgan (2020), future research could explore an array of targeted skills and behaviors to support this population. For example, future research could explore basic video modeling to teach social skills during physical education (i.e., play initiation, turn-taking). Future research could explore self-video modeling to show the learner that they can complete a challenging task (i.e., riding a bike, walking on a balance beam, or climbing a rock wall). In addition, future research could examine point-of-view video modeling to show a first-person perspective to programming a treadmill, stationary bike, or an elliptical machine. Lastly, future research could explore video prompting to teach an array of fundamental motor skills, classroom procedures, and putting on athletic attire or safety equipment.

In closing, the results of this systematic review have found video modeling to be a promising intervention. However, given the heterogeneity of this population, additional research is needed. Practitioners may be able to implement video modeling to support physical activity among children with ASD. Strategies are needed to promote physical activity among children with ASD considering the low amounts of physical activity reported (McCoy & Morgan, 2020) and motor skills (Liu et al., 2014). With ongoing research, perhaps video modeling could be a very

promising intervention to support and increase participation in physical activity in children with ASD.

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Practicing Teachers' Use of Online Tools for IEP Goal Writing and Instructional Support

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Abstract

This study investigated special educators' perspectives about an online toolkit that offers teachers example goals and objectives statements to use in service plans for students with special educational needs as well as teaching strategies and assessments. Special education teachers in a large school district in a Pacific Northwestern state answered a short survey (n=19). Some respondents also participated in group interviews (n=6). The research questions were: what are special education personnel's perspectives about the online toolkit materials for writing goals and objectives for children with special educational needs; and, what do special education personnel perceive to be online toolkit's limitations as well as weaknesses? Results indicated that the participants preferred to use the online toolkit for identifying initial ideas for goals and objectives statements in the disability service plans. However, the teachers desired more professional learning and collegial dialogue to learn about instruction, strategies, and assessment tools. The authors also discuss implications and suggested next steps for online tools in professional learning for teachers.

Practicing Teachers' use of Online Tools for IEP Goal Writing and Instructional Support

Teachers have a varied set of demands and tasks to manage in providing educational experiences for children in an era of technology and use of mobile devices. Typically, teachers of a given grade level will have some students operating above and some below grade/age-level ability in core subjects (i.e., reading, writing, math) as well as social skills. For children who with special educational needs, placement in classes with teachers who have specific qualifications is often a next step (Ysseldyke, 2005). Included in a list of factors impacting special education placement include the use of standardized tests, with their racial and ethical biases, as well as teachers' race/ethnicity, socioeconomic status, and years of experience per the child in question (Woodman & Harris, 2018). Once students are placed, special education personnel manage disability service plans in some countries (citations). In the United States, these plans are called Individualized Education Programs (IEPs). An IEP includes short- and long-term instructional and assessment planning in response to a student's unique strengths and needs (Bateman & Herr, 2011). In recent years, educators have helped develop interventions to address student needs as well as curriculum-based measurement systems (CBM; Deno, 2003; Hosp et al., 2016) to identify specific strategies.

The process for a student being considered for special education services typically follows a referral, assessment, and placement decision process. A teacher (or parent) usually initiates a referral. For dyslexia, the multidisciplinary assessment's task, traditionally, is to determine if a clear discrepancy exists between a student's potential (i.e., IQ) versus their academic

achievement; the assessment results should also help inform what accommodations and/or modifications are to be provided to the student. If a disability is diagnosed, an IEP will be created and the students will receive special education programming. In the late 1970s, educators and researchers began to question more and more the use of standardized tests for racial biases (e.g., asking a child new to the US the question: what does a US Senator do?) as well as ethical problems (e.g., asking a child to answer comprehension questions about a reading passage when decoding may be an underlying difficulty). In the 2004 reauthorization of IDEA, states were given the option of allowing schools to use IQ/achievement discrepancy or a response-to-intervention (RTI) framework. Educators could use data collected from curriculum tasks in the classroom (curriculum based measurement; CBM) as a guide to school teams about students' change in skill levels over time. RTI and its more recent iteration, multi-tiered systems of support (MTSS) as mentioned in the federal general education law (Every Student Succeeds Act, 2015), has teachers use CBM to define students' strengths and weaknesses, make goals for continuing progress, and discern best practices for instruction. With special education teacher's having many students on their caseload with varying levels of ability, educators need sources for instructional ideas.

Online tools offer teachers a repository of resources for instruction and for IEP goal development (e.g., Quill for writing, Math Learning Center, Kahoot for teacher-development courses). A growing number of websites offer students and teachers interactive tools to help with reading, writing, math, and other skills (Ferlazzo, 2020). For example, education dashboards are interactive websites that use images, icons, pie charts, graphs, proportionally-sized shapes, etc. to show data and relationships about a student(s). Education dashboards can be used as a decision-making tool to help educators in planning their curricula, evaluating students' knowledge, and variance in students' skill levels over time (Xhakaj et al., 2017). Also, dashboards help teachers to better address students' needs, collaborate with colleagues, and to reflect upon their own practices (Schwendimann et al., 2017). Michaeli et al. (2020) used quantitative and qualitative methods, within the framework defined by the International Society for Technology in Education's (ISTE) Standards for Educators, to investigate Israeli elementary teachers' use of education dashboards and the impacts on their professional growth. Michaeli et al. concluded that the teachers' use of education dashboards positively contributed to the extent to their professional growth as facilitators, analysts, and designers.

Little is known about how teachers perceive web-based tools and what their intentions are for using them. New technologies are often presented to teachers without advanced collaboration (Snoeyink & Ertmer, 2001; An et al., 2017). To better understand how teachers use a web-based tool, this study focused on one tool provided to teachers in a large urban school district in the Pacific Northwest. This study entailed a mixed-methods design with an online survey of teachers describing their perspectives about online web tools as well as follow-up semi-structured interviews with six special education teachers about the tools.

Research Questions

1. What are special education personnel's perspectives about using an online toolkit for writing goals and objectives for students with special educational needs?

2. What do special education personnel perceive to be online toolkits' limitations as well as weaknesses as a source of personalized professional learning?

Review of Literature

Reading, writing, math, social skills, and social-emotional learning are some examples of the foundational aspects education that students are expected to progressively master in each successive grade. For example, 25% or more of students cannot write at a basic level (e.g., NAEP, 2017). Low-performing and disadvantaged schools often lack the internal capacity to improve (OECD, 2012, p. 113). Yet, the purpose of public education is to address these issues and provide inclusive practices as, "...an integral element of the expression and realization of universal human rights" (United Nations, 2007, p. v).

For children who are placed in special education, the school team and parents/guardians are to meet to write an IEP that contains information about the student's present levels of performance, goals for increasing performance, and services that will be offered to support the goals. Curriculum standards and state test results provide a starting point for this process (e.g., Common Core State Standards, 2020; Smarter Balanced Assessment Consortium, 2020). The goals are decided by the school team, which consists of a representative administrator from the local educational agency (usually the school or district), a general education teacher, special education teacher, parents, the qualifying young person, and other related personnel, such as therapists. However, drafting the language of the goals is usually the responsibility of a special education teacher. Despite the importance of this responsibility for making a bridge between present levels of achievement of future success as well as dictating the services students will need to achieve, special education teachers receive little initial preparation in goal writing and other paperwork associated with the student's IEP (White & Mason, 2006). Therefore, special education teachers often experience difficulties and need professional learning experiences and other supports to assist them in learning this skill (Alberta Education, 2006; Manitoba Education Training and Youth, 2001; Mattatal, 2011; Seigel, 2000).

Special education teacher professional development has included a focus on a goal-setting model from business management called SMART—Specific, Strategic, Manageable, Attainable, Realistic, Relevant, Results-oriented, and Time-bound (Prather, 2005). However, writing goals that meet *all* of these criteria poses substantial challenges for teachers (Mattahal, 2011). The difficulties arise because writing a goal with all of these qualities is a highly technical endeavor. In addition, students with disabilities often have multiple areas within a content area where they are unable to demonstrate their knowledge to the level their peers can. Thus, it is often overwhelming to identify all the possible goals and then choose the most important among them. Moreover, some subject matter receives more attention than others. These areas include reading and writing proficiencies and numeracy performance (Hessler & Konrad, 2008). As a solution, some have proposed Curriculum Based Measures (CBM; Deno, 2003; Hosp et al., 2016). When operating from a CBM approach, teachers must:

determine a student's baseline score, or current performance level, and combine it with empirically established performance standards or rates of growth, to predict year-end achievement results. These year-end results can be written as goals, and progress toward

the goals can be monitored on a regular basis to determine how well the student is learning (Mattahal, 62).

While CBM usage may hold some promise in supporting teachers' strategic choices of goals, one can see from the definition above that there is considerable technical and evaluative skill that goes into determining a goal. Also, CBM professional development does not inherently teach teachers to write the goals per SMART requirements. Finally, CBMs are limited to areas of reading, writing (including spelling), and mathematics because these are the only areas that are directly tied to curriculum most classrooms (Hosp, Hosp, & Howell, 2007). Other goals that might be critical for students, but do not fit within CBM parameters or might not lend themselves to articulation as SMART goals are often left to the wayside. Some examples of these difficult to write, but important goals include problem solving skills, creativity, communication, and physical tasks.

The move to professional learning experiences using online tools might have potential to improve opportunities for teacher to learn to write IEP goals. However, when Author2 (2017) interviewed 14 special education and general teachers from seven states about the topics of their online professional development related to special education, no teacher reported IEP goal writing as a topic. Instead, much of the professional learning was focused on team building, sharing announcements, and determining how to implement IEP goals that were already written. Thus, while an IEP goal might seem like a simple sentence, it is a source of considerable complexity and frustration for special education teachers.

Special Education Teachers' Use of Online Resources

To do their work, teachers need resources (Wolgast & Fischer, 2017). The internet is a source for many such resources, but locating and vetting them takes time. Studies of teachers' use of online resources suggest that teachers spent substantial amounts of time using search engines to look for ideas for lessons (Moore & Chae, 2007; Shapiro, Sawyer, Dick, & Wismer, 2019). To circumvent this need to evaluate resources some teachers are willing to pay out-of-pocket for lessons and other materials that were created by fellow teachers—with the sense that because teachers created them, they are inherently more trustworthy (Shelton & Archambault, 2019). However, there is some debate over whether teachers have the right to sell content that they generated with their employers' resources and using public school children as the pool to test and pilot their products with the knowledge and consent of the children or parents.

For special education teachers specifically, Billingsley et al. (2011) highlighted some of the online resources that special education teachers could use (e.g., cast.org; interventioncentral.org). However, they did not identify online resources that were specific to how to write IEP goals—which is one of the tasks that special education teachers struggle the most to do (White & Mason, 2006). Even so, these researchers did identify several resources for enhancing content knowledge, using teaching strategies, conducting assessment, designing behavioral interventions, and making space for professional connectivity and self-care.

While online resources in special education have some advocates, there is also research suggesting that using online resources is not a positive activity. For example, Sawyer and Myers (2018) found that early childhood teachers used online resources less than their elementary

teacher counterparts. The analysis of their data led them to believe that elementary teachers lacked practicum experiences compared to the early childhood teachers and, therefore, the elementary teachers were using online resources to compensate. The implication of those findings was that when special education teachers have strong preparation, they do not need to resort to online resources. If this conclusion is widespread in teacher education, then it stands to reason that special education teachers would be hesitant to draw on online resources, even if they were struggling to generate lessons, direct behavior, or construct technical documents.

Strategy Instruction

Instruction is part of a multi-element process in education. While the content and application of information via strategies is often what people view as most visible in school, teachers should have a clear sense of a students' current level(s) of functioning to choose and define goals for next steps in programming. For these reasons, instruction should be driven by assessment. Strategies and classroom practices can then be paired with the students' needs. Specificity in goal writing helps everyone on the IEP team know and address what the target tasks are (Jung, 2007). Furthermore, the Individuals with Disabilities Education improvement Act (2004) stipulates the need for instruction to be research/evidence based. Some educational entities have initiated their own systems to suggest to educators what types of strategies/instruction meet research/evidence criteria (e.g., Council for Exceptional Children [Cook et al., 2014], American Speech-Hearing Association [2004], National Center for Response to Intervention [2020], and the What Works Clearinghouse [2020]).

Self-regulated strategy development (SRSD) is one example of a highly-effective instructional practice. Graham et al. (2014) meta-analysis of SRSD research concluded an effect size of 1.14. Through a teacher's review of SRSD's six steps of analyzing students' work samples, choosing a new strategy to offer students that address areas of students' weakness(es), explaining the new strategy to the students, modeling the steps, offering the students guided practice with the teacher, and students' attaining enough proficiency to maintain the strategy in memory and for application in other similar activities (generalization; e.g., a story writing strategy that could also help with writing an historical narrative; Author1, 2016, 2015), students can improve their skills over time and potentially meet their goals and objectives. While there is fidelity of implementation in the process of controlled research studies, this may often not be the case in teachers' day to day instruction. The demands on teachers' time and limited professional learning for mapping research/evidence-based instruction for students' goal attainment can render fidelity of implementation to be a challenge (Capizzi, 2008; Jung, 2007). The Reading Recovery (Clay, 1993) literacy intervention for first-grade struggling readers may be one example. While there is sufficient research to classify it as a research/evidence-based instructional program per the criteria of the Council for Exceptional Children and What Works Clearinghouse, as two examples, there is also a wealth of evidence that illustrates Reading Recovery as not effective. The program is also costly (e.g., one teacher: one student over eight or more weeks for 30 minutes per day).

Providing students with appropriate opportunities to learn can be challenging for teachers to manage (Taub et al., 2017) given time, personnel, and resource limitations. Teachers appreciate tools that can help to formulate a student's goals/objectives within a four-types-of-curriculum framework: *intended*, *planned*, *enacted*, and *assessed* curricula (e.g., Kurz, 2011; Kurz et al.,

2014). For teachers of students with disabilities, these four components can prompt significant barriers to providing opportunities to learn such as curriculum content (e.g., that teachers of students with disabilities feel led to focus more on functional skills as compared to academic content), access to what is offered in general education classes or other educational contexts, established communication systems for engaging in instruction (e.g., alternative or augmentative communication), and instructional materials and supports (Kurth & Keegan, 2014). The authors discussed the reality of many special education teachers' having the role of *case managers* as compared to *primary instructor*. Teachers are challenged with high caseloads, ongoing paperwork tasks, supervising paraeducators, assessing students, creating adaptations, collaborating with other educators and families, and many other roles. To create quality adaptations requires extensive time spent with the general education teacher as well as creating appropriate materials and activities that fit a student's goals/objectives as well as strengths and weaknesses; this reduces time for direct instruction with students. The practice of special education for a student is a multi-component process; but in reality, it can be too large for one teacher to manage. Teachers' "interesting ideas" and chosen activities carry the hope of learning.

Methods

The authors employed a convergent parallel mixed methods design (Teddlie & Tashakkori, 2009). The quantitative and qualitative data were collected and analyzed independently and over a contiguous timeframe. The results of both methods were then brought together and analyzed concurrently to allow each set of data (qualitative and quantitative) to inform the results and interpretations of each method (McCrudden et al., 2019; Schoonenboom, & Johnson, 2017). With an online survey, a large group of special education personnel answered their perspectives about the strengths and weaknesses of online tools as well as how often and for what purposes each respondent used them. The first author observed in-school Building Assistance Team (BAT) meetings (N=4; each one hour) where educators discussed students' progress with short- and long-term goals. The follow-up, semi-structured interviews provided the opportunity for the self-nominated subgroup to offer more details about their use, likes, and dislikes of the online tools. The authors received human subjects' approval to complete the study.

Setting

Participants were special education personnel in a large school district in the Pacific Northwest region of the United States. The district had almost 25,000 students enrolled with 71% regularly attending. The gender distribution was: 48% female, 52% male, and 0.1% gender X. Race/ethnicity was: American/Alaskan native 0.4%, Asian 6.1%, Black/African American 2.8%, Hispanic/Latino of any race(s) 25.3%, Native Hawaiian/Other Pacific Islander 2.1%, two or more races 8.9%, and White 54.4%. Students' success with curriculum standards were: about 50% for English/Language Arts (ELA), about 39% for math, and about 40% for science—including high math (31%) and ELA (27%) growth. About 14% of the students enrolled had a disability.

There were about 1,700 teachers (72% female, 28% male) with an average of 13 years teaching experience. Their race/ethnicity distribution was: American/Alaskan native 0.2%, Asian 1.8%, Black/African American 1.1%, Hispanic/Latino of any race(s) 3.4%, Native Hawaiian/Other Pacific Islander 0.4%, two or more races 2.3%, and White 88.8%.

Participants

A total of 19 special educators completed the survey: 10 elementary, 4 middle school, 2 high school, and 3 teachers who were itinerant at two or more of these levels. Their assignment types were: 7 learning support, 3 social communication integration programs (SCIP), 4 academic learning classrooms, 2 learning support/SCIP, and 3 speech and language pathology. Six special educators participated in the focus group interviews (three per interview). Table 1 contains additional information about these participants.

Table 1

Participants' Descriptive Information

Pseudonym name	Role	Years in Education	Race/Ethnicity
Bill	High school special education teacher	22	White
Evan	Middle school special educator	4	White
Kathy	Speech and Language Pathologist, elementary/secondary schools	10	White
Lauren	Elementary special educator	29	White
Cynthia	Elementary special educator; Grades 3-4 SCIP	3	White
Nancy	High school special education teacher	16	Mixed

Instrument Development

Survey. The survey included questions such as: the respondent's school type (e.g., elementary, secondary), teaching assignment, frequency in accessing online tools, what component(s) (e.g., goals, present levels wizard, strategies), percentage of time spent on each component, what each respondent liked or did not like about online tools, the impact of their use on students' learning, and if the respondents experienced any barriers in using online tools. To ensure the validity of

the content of the survey, the researchers consulted previous research noted in the literature review. They also collaborated with district special education administrators regarding what they would like to know about how teachers used the online webtools.

Qualitative Interview. The authors created the interview questions from existing research and the areas of content included in the online webtool (e.g., goals and objectives, instructional resources). The second author's evaluation research also helped inform the content of the questions. The results of the online survey also helped inform follow-up questions that could be posed during the interview's discussion. Also, the first author attended and took notes about educators' discussions about students' progress with short- and long-term goals during a series of building assistance team (BAT) meetings. They included the school psychologist, special education teacher, and related services personnel (e.g., speech and language pathologist). In the meetings, there was no mention of online tools specifically. The team discussed specific behaviors or recent challenges and trends; academic programming was not a prime topic. The team would formulate some next-step strategy ideas. This information was used to determine what teachers' concerns might be as they approached the use of online tools.

Data Analysis

Survey. The authors reviewed the descriptive statistics provided by the survey's respondents to determine the frequency across the Likert-scale range for each question. Respondents could also offer comments to help explain their answers.

Group Interviews. For qualitative data analysis, the authors used a five-step thematic analysis approach (Gale, Heath, Cameron, Rashid, & Redwood, 2013). They divided the thematic analysis into five steps; they individually completed steps 1-4 and later met to compare notes and complete step five. The five steps were: 1) reading the data multiple times to become familiar with the content; 2) identifying categories as well as overarching subthemes; 3) cross-referencing our notes to the research questions to participants' ideas; 4) using participants' verbatim keywords to correspond to the coded themes; and 5) reviewing the matrix within and across participants to develop coherent themes and possible explanations of interviewees' comments and ideas (Creswell & Clark, 2018). Table 2 contains examples of coding data.

Table 2

Example Coding of Interview Data

Coding labels	Sample Quotes	Notes and Ideas
Resources, goal selection	I need a broad spectrum of activities to help have choices to be of interest to students. Resources with social goals is a helpful component too to have in a resource. (Elementary/secondary special educator).	Student activities need to be high-interest. Integrating academic with social skills goals helps with this.
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Present levels of performance goals.	The present levels of performance have been useful for me in terms of a summary; I edit the phrasing to fit my students' profile. (high school special educator).	Edit provided goals as needed,
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After a preliminary set of themes was developed, the researchers worked to reduce these to salient themes that would illuminate the research question. The final themes are shared in the results section.

Limitations

The survey sample for this study was small and homogeneous. The invitation was sent to only one district as they, being a large school district in its region, had invited the researchers to attain online tools user's perspectives about the tool. Some teachers expressed that the demands of their teaching assignments did not provide time for participation.

Results

This study explored teachers' views about online instructional resources and tools. Participants completed an online survey (N=19) and six agreed to be part of a follow-up group interview.

Survey Data Results

The survey responses are provided in Table 3.

Table 3

Survey Questions and Responses

Question	Responses
Type of school	Elementary 53% Middle school 21% High School 11% Multiple levels or district wide 16%
Educator's role	Learning Support 37% Social Communication Integration Program 16% Academic Learning Classroom 21% Multiple roles/related services (e.g., SLP) 26%
Frequency in using online tools	Daily 5% Weekly 32% Monthly 26% Bi-Monthly 5% Periodically/As Needed 32%
Purpose in using online tools	Goal Writing 63% Strategy Ideas 5% Multiple Purposes (e.g., tool's multiple features) 32%

Satisfaction with online tools for IEP and Special Designed Instruction Development	Extremely Satisfied: 10% Very Satisfied: 60% Somewhat Satisfied: 10% Somewhat Dissatisfied: 10% Very Dissatisfied: 0%
Satisfaction with online tools for behavior tools and practices	Extremely Satisfied: 17% Very Satisfied: 32% Somewhat Satisfied: 42% Somewhat Dissatisfied: 9% Very Dissatisfied: 0%
What is your overall opinion of online tools	Extremely Satisfied: 22% Very Satisfied: 54% Somewhat Satisfied: 12% Somewhat Dissatisfied: 12% Very Dissatisfied: 0%

The reliability analysis of the survey used the items on a scale comprising four Likert items. Cronbach's alpha showed the questionnaire to reach acceptable reliability, $\alpha = 0.88$. All items appeared to be worthy of retention as the range of means was 3.4-4.2 (SD=1.9-2.1).

Qualitative Interview Findings

The themes and subthemes of the findings from the semi-structured focus group interviews are presented in Figure 1.

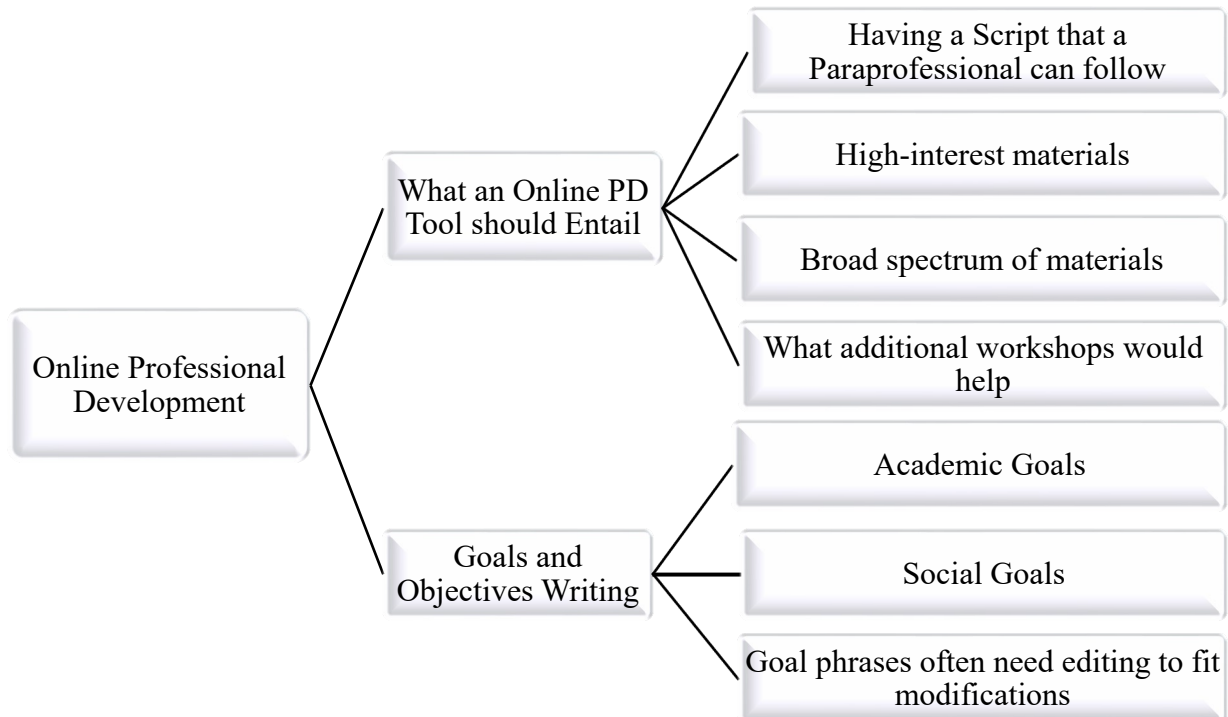


Figure 1: Themes and Sub Themes

Theme 1: What an Online Professional Resource Tool should Entail

While goal writing is an essential part of special education, daily activities with students provides the process to help students improve in their skills to improve and hopefully attain a given goal. With the district not providing curriculum materials, teachers must find and develop their own while working to address the Common Core State Standards. “High interest material is a must. I have no need for videos. Books with high-interest pictures are much better” (Bill, high school special education teacher). Managing these materials with paraprofessionals as the instructor adds another requirement: “A curriculum resource has to be something I can give to an assistant that they can do and manage.” An elementary/secondary speech pathologist added: “I need a broad spectrum of activities to have choices that are of interest to students. Resources with social goals is a helpful component too to have in a resource.” Evan, a middle school special educator, commented about teachers’ needing to create their own activities. “I design lessons with my own content. I find Newsela, superteachers.com, education.com, and Reading A-Z great for adapting to lower levels.” To improve online tools, Bill commented during the group interview.

I would rather online tools be modified to offer even more ideas for goals—to help me strategize for the next steps in a student’s programming. For high-needs goals, it would help for online tools to have more ideas for student activities.

Bill’s explanation reflects an interest in additional support for students who have significant challenges. He expressed a clear desire for more materials that would help him spend his time well with students.

Theme 2: Goals and Objectives Writing

The interviewees found online tools’s goal and objectives lists as the most useful component for them to use. Bill commented that he,” cannot imagine trying to manage goal writing without it; Online tools makes goal writing quicker and easier through the drop-down menus and clicking the buttons to make a goal. He then copy/pastes into IEP Online.” Like Bill, Lauren too, “would like easier transfer from Online tools to IEP Online. It would help if online tools and IEP Online were more seamless.” Yet, she also mentioned that there is the provided phrases need editing as only adjacent grades levels are offered for a given goal. It can be difficult to reword a goal and have it retain the same meaning (e.g., setting component of a goal). How should a teacher edit a kindergarten-level goal for a student in fifth grade?”

The interviewees liked online tools for goal-and-objectives writing too. Kathy voiced a common summary: “Online tools helps the educator to write individualized goals. The strategies are helpful to general education teachers too. I think it is an awesome resource!”

Evan: I think online tools is the best for goal writing in special education. I can find lots of operations/math goals. I have heard that online tools offer even more goals resources for modifying to a lower grade level.

Cynthia: Online tools helps me find relevant goals to the standards and grade levels. I also use other sources for adaptive skills’ goals. Online tools are useful for 70-80% of the goals that I write. Online tools help me to write more correct and effective goals to guide learning.

The emphasis in this explanation is on finding a goal that is structurally correct and that will facilitate students’ learning. The teachers were most satisfied when they felt like they could take a goal and use it with little to no modification.

Discussion

The authors’ aim for this study was to explore teachers’ perspectives about online tools as a webtool for goal and objectives writing for students’ academic, social, and behavioral programming. The research questions were: what are special education personnel’s perspectives about online tools as a useful tool for writing goals and objectives; and, what do special education personnel perceive to be online toolkit’s limitations as well as weaknesses? From the survey, observation of BAT meetings, and interview data results, the participants stated that they liked using online tools and would like more professional learning to learn how to use even more of the tool’s features.

Most of the participants stated that online tools helped them create better goals and objectives for students' IEPs. Online tools helped to fill the professional learning gap (Alberta Education, 2006; Manitoba Education Training and Youth, 2001; Mattatal, 2011; Seigel, 2000; White & Mason, 2006). The participants liked how online tools was aligned with the Common Core State Standards (2020). Although the goal and objectives' phrasing did not always match with IEP Online, the school district's chosen cloud service for IEP files, online tools offered ideas and an initial phrase that the teachers could then edit into what they wanted to use.

Some teachers mentioned that the strategies component of online tools was the most helpful part of the tool. They would like to have more professional learning opportunities about how to pair strategies with IEP goals. Strategy instruction with engaging activities provides a means for students' skill levels to improve (Graham et al., 2014; Taub, McCord, & Ryndak, 2017). Online tools or similar programs might consider short, asynchronous online webinars, or provide online facilitators to support teachers.

As for weaknesses and limitations, the participants perceived an insufficient amount of content for high school. While online tools offered good ideas, some teachers expressed that they often had to craft their own goal and objective phrase to address a skill or concept. Providing additional materials for secondary learners would help address the time teachers spend searching for resources (Moore & Chae, 2007; Shapiro, Sawyer, Dick, & Wismer, 2019). Online tools could also offer more for behavior and adaptive (life) skills.

Implications for Practice

Online tools seemed to be important for teacher learning for the teachers in this study. This district and others who offer online tools or similar programs should consider offering more professional learning opportunities to learn about the programs. Specifically, this professional learning should include practicing teachers as presenters to promote teachers' learning, collegial sharing, and dialogue, which as an important recommendation from the teachers in this study.

Moreover, additional professional learning should focus on supporting the teachers in moving from the learning goal to the strategies in the online tools (or similar) program, but it cannot end there. An additional element is needed where teachers are then supported in determining how to make activities with the strategies to teach particular subject matter. For goal writing, the professional learning should include information about teacher judgment and the goal writing process in general, rather than just showing teachers the technical steps of using the tool.

Future Research

A future study could include teachers from multiple districts that offer participants the use of online tools or similar programs. Indeed, we need to know more about how teachers' make sense of particular tools for use in their practice. Researchers also need to know more about how efficacious teacher professional learning about technological applications is translated into practice. Finally, there seems to be important need to prepare teachers better to write goals and customize them for students. Research base on this topic could be greatly expanded at both the preservice and in-service levels. While there seems to be no harm in giving teachers examples to work from, students might be better served if teachers were better prepared to compose and

revise the goals for better individualization for students. Surely, just copying and pasting from a selection of goals was not the intention of IDEA (2004). Even so, examples of instructional activities can be a help to teachers, and more research about which crucial teacher tasks can be supported by webtools should be pursued.

Conclusion

This study examined special education teachers' perceptions of an online toolkit. Teachers appreciated the support for their instruction, but they had difficulty imagining how to move from goal to strategy to activity. Future research might tackle the problem of providing more support and extended modeling for teachers. This support might consider teachers' need to understand the entire event of intention, planning, enacting, and evaluating instructional materials using online resources (Kurtz, 2013). Teacher education might also consider ways to ensure that teachers understand the use of online resources as a positive or at least neutral activity in their professional development.

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Special Education in Rural Mexico: Two Schools in Jalisco

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Abstract

This article provides an overview of current special education policy in Mexico and highlights two successful schools in rural Jalisco that have garnered recognition as particularly creative and responsive institutions. A void exists in the literature about the types of specialized services that children with disabilities are likely to encounter south of the border. U.S. educators can maximize the success of their Mexican origin special needs students, by having a better understanding of this schooling context. The topic of this paper is of particular urgency to a record number of families who are facing voluntary or involuntary deportation, and who are concerned about access to quality services for their differently abled children, particularly if they find themselves in rural communities.

Special Education in Rural Mexico: Two Schools in Jalisco

Immigrant parents facing a voluntary or involuntary move to Mexico have many concerns about relocating their families. Access to quality education for their children is a top consideration, particularly if they have children with disabilities.

These concerns are not unfounded. Numerous studies have found that US citizen children in Mexican schools tend to struggle in several areas, including but not limited to: bureaucratic obstacles (Jacobo, 2017; Medina & Menjivar, 2015), pedagogical differences and language of instruction (Despaigne & Jacobo, 2016; Panait & Zúñiga, 2016; Sánchez & Zúñiga, 2010), as well as bullying and issues of identity and belonging (Author, 2017; Jacobo & Landa, 2015; Zúñiga & Hamann, 2009).

For those with severe disabilities that have been institutionalized, the risks can be particularly high, as reported by Disability Rights International which found “torturous” conditions in multiple Mexican facilities (Rodríguez et al, 2018).

While these cases do raise alarm, there are also examples of appropriate services offered to disabled students, both in regular classrooms and in specialized schools throughout Mexico. This article seeks to help parents and educators understand the type of services that disabled students may likely experience in Mexico, assuming these services continue to be adequately staffed and funded.

The section below provides an overview of current special education policy in Mexico, and

highlights two successful schools in rural Jalisco that are supported through public and private partnerships.

A better understanding of the schooling context of special needs students who have immigrated from Mexico--or who may return at some point--can help us to maximize their opportunities for success in this country.

Significance

Worldwide, people with disabilities are more likely to experience poorer health, fewer economic opportunities, and higher poverty compared to people without disabilities. Persons with disabilities may also lack equal access to healthcare, education, and necessary disability-related services. When barriers to those services are lifted, individuals are more empowered to participate in their society, which thereby benefits the entire community.

In Mexico, there are an estimated 9.17 million persons with disabilities, representing 7.5% of the population. Of those individuals, the majority have a physical, visual, or auditory disability¹ (PADCC, 2019). Compared to the overall population, a greater percentage of disabled people live in rural areas and experience poverty (45% vs. 11.3% of total population)

Official Mexican reports cite a much smaller percentage of people with disabilities. In the 2000 census, only 1.8 % of the population reported having a disability, mostly in urban areas². International Disability Rights groups estimate the percentage of disabled people in Mexico to be more like 7.5%³ of the population. Underreporting may be due to stigma, as many individuals with disabilities and their families choose to hide their disability. People with disabilities in Mexico often report alienation and the sense of pity from their peers and others, rather than experiencing empathy or compassion.

Students may also try to avoid stigma by not accessing disability services, or by not attending school at all. According to statistics by the advocacy group Global Disability Rights Now⁴, only 62.6 % of children with disabilities aged six to fourteen attended school, compared with 91.3 % for those in the same age range without disabilities. Moreover, only 3.6 percent of the overall population with disabilities had finished university.

In theory, Mexican law prohibits discrimination against persons with physical and mental disabilities in employment, education, access to health care, and the provision of other services. Moreover, Mexico has a long history and strong foundation to support special education programs. Teachers are required to receive training to work with special education students, and legislation seeks to include disabled students in regular classrooms.

¹ Based on official census data, no information provided on intellectual or learning disabilities

² Disability Information and Statistics for Central America and Mexico, *Disabled World*. Retrieved February 17, 2019.

³ Disability Directory: Mexico. <https://www.disabilityIN.org>; <https://www.globaldisabilityrightsnow.org>

⁴ Global Disability Rights Now: Disability in Mexico. <https://www.globaldisabilityrightsnow.org/infographics/disability-mexico>

In practice, however, the government does not always enforce the education laws, for example, not all schools properly diagnose or serve students with disabilities, and many rural areas lack special education programs. It is estimated that 341,000 out of approximately two million students with disabilities actually received services, and nearly 45% of the country's poor rural municipalities lacked special education programs (US Dept of State, 2011) Moreover, only 3.5% of students on the autism spectrum appeared to be receiving any specialized services in 2005 (PADCC, 2019).

While these are sobering statistics, there is evidence that in more recent years the Mexican State has implemented fundamental reforms designed to improve the education system for disadvantaged students, particularly for those with disabilities. The next section provides an overview of Mexico's special education system and recent policy changes. We then highlight two schools in rural Jalisco, started many years ago through private initiative in response to a lack of available public special education services. Both programs have since partnered with the state's education department, and continue to serve a vital role in their communities.

Special Education in Mexico

Long before the first special education laws were enacted by the federal Secretariat of Public Education (SEP) in 1993, there were efforts to provide for the needs of people with disabilities. Among the first schools established in Mexico City were the National School for the Deaf in 1867, and the National School for the Blind in 1879. In 1914, a school for children with intellectual disabilities was established in Leon, Guanajuato. Training for teachers to work with special needs children were offered through the National Autonomous University of Mexico from 1919-1927 (Cieloha, 1986).

Special education programs continued to expand, but the majority of these were only available in the capital or other major urban centers. By 1979, all 31 states had special education coordinators, but quality and resources varied considerably (Shepard, Contreras & Brown, 2002). While the national education system in Mexico is led by the SEP which establishes norms and regulations, each of the 31 states in the country has autonomy in operating their own education systems and providing initial teacher education. To date, large gaps exist in the quality and quantity of educational services provided to people with disabilities amongst the different states, particularly amongst rural communities.

In 1993 The General Education Law passed, which was the first federal mandate obligating states to address the needs of special education. During this decade, a national effort was made to improve the quality of education for all children, including those with disabilities. During the next few years, educational, health, and social welfare agencies implemented significant changes in the services provided to children with learning or physical disabilities, and passed a series of other initiatives between 1995-2000 including: the National Program for the Welfare and Incorporation into the Development of Handicapped Persons; the National Registry of Minors with some Indication of Handicap; and the Program of Educational Development.

As a result of inclusion goals established during this period, Mexican educational, social welfare, and health agencies began to implement provisions to serve students with disabilities through the implementation of two new programs that are currently in practice: USAER *Unidades de*

Servicios de Apoyo a la Educación Regular (Regular Education Support Services Units) and CAM, *Centros de Atención Múltiple* (Multiple Attention Centers).

Students with learning disabilities could be mainstreamed in regular schools with assistance from a USAER team. USAERs usually consist of a team that includes a social worker, psychologist, speech and language therapist, and a special education teacher. USAER members provide technical assistance to the classroom teacher and support to special needs students and families. They may also visit classrooms and initiate the referral process based on their observations. USAERs typically serve four or five schools, spending one day per week in each.

Students with severe disabilities attend CAMs, where they receive instruction at the pre-school, elementary and middle school levels, and often vocational training as well. Many CAM institutions were based on existing special education schools that were reconfigured to serve children with a variety of disabilities.

The process of identifying needs and providing services was to be coordinated through regional Resource Educational Inclusion Centers known as CRIEs (*Centro de Recursos para la Inclusion Educativa*) which would refer students to either a CAM school or USAER support units. See Table I below for further description of each program.

Table 1
Special Education Programs in Mexico

Key Elements	USAER (Unit of Support Services for Regular Education)	CAM (Centers of Multiple Attention)
Target population	Designed to serve children placed in a regular classroom environment (average case load of 20 students)	Educational settings for children with severe intellectual or physical disabilities that face barriers to learning in regular classrooms
Providers	Composed of multidisciplinary teams (typically SPED teachers, social worker, psychologist, speech therapist)	Students typically placed in a CAM after a USAER team has recommended placement with parent consent
Goals	USAER teams provide initial student evaluation, setting and monitoring curriculum goals and methods, individualized student sessions	CAM teachers provide appropriate modifications to help students access core curriculum. Students were initially grouped by disability or performance level, currently grouped by grade level
Support and Monitoring	USAER teams conduct annual school site visits to support specialized instruction for students and teachers	Students may also receive supplemental support services (e.g. speech therapy, behavior management, vocational skills, etc.)

Current Educational Policy

The 1990's brought many advances in support and services to students' families navigating disabilities. The number of special education teachers and training for these teachers also increased significantly, and many progressive policies were put in place during this period. However, severe neoliberal policies during the next two decades drastically reduced funding and support for these services and policies.

More recently, there have been substantial educational reforms that have focused on increasing inclusive or "integrated" practices within the general education classroom. Also, teacher training for inclusion has increasingly becoming an important aspect of pre-service training. A 2012 constitutional reform made quality education a right for all Mexicans. This resulted in the New Educational Model (*Nuevo Modelo Educativo*) which was implemented in 2018. The goals were to promote compulsory education to ensure all students are able to develop skills for the 21st century, with a greater emphasis on developing socio-emotional skills and competencies rather than rote learning. While advances have been made in providing more a more student focused competency based curriculum, a key challenge during implementation has been to ensure clarity and consistency, while also allowing for adequate flexibility in adapting to diverse educational contexts throughout the country (OECD, 2018).

In 2014, the Program for Inclusion and Educational Equity (*Program para la Inclusion y la Equidad Educativa*) aimed to strengthen the capacities of schools and educational services that serve indigenous children, migrants, and students with special needs. It prioritized gifted students as well as those with disabilities, and those attending tele-secondary and multi-grade schools. Financial and academic support was targeted to improve the infrastructure of disadvantaged schools. In 2016, it catered to 170,000 students (OECD, 2018).

Current Mexican educational policy is based on the premise that special education students have difficulty accessing the content included in the national plans and programs of studies and therefore need additional resources. As in the US, equity access and inclusion has become a major component of current special education policy. Inclusive education in Mexico is described as the "the right of every child to be enrolled in school and to meet his or her basic educational needs" (p.4) (Garza, 1999).

Increasingly, Mexican educators no longer focus exclusively on the particular medical diagnoses exhibited by individual students. The clinical-rehabilitation model has been replaced by a more holistic approach which considers factors such as the school, home, and community environment as well as methodological issues that may impact a child's progress.

These policy advances are very promising, but challenges remain for providing equitable access to quality education for all students, particularly for disadvantaged communities and special needs children. Adequate funding and support is one of the greatest impediments to implementing these worthy goals and advances. Perhaps it is no wonder, then, that some schools that have been recognized as being particularly successful in meeting the needs of children with severe disabilities have relied on partnerships with private foundations to support their missions. Below we look at two noteworthy examples, both located in rural areas within the state of Jalisco.

Two schools in Jalisco

Both of the educational centers highlighted here have garnered recognition as particularly creative and responsive institutions. They are located in rural communities within the state of Jalisco. The state of Jalisco is found in the central western part of Mexico and has historically been a state with a large degree of migration to and from the U.S. Jalisco counts with 138 (mostly public and a some private) Centers for Multiple Attention (CAM) or special needs schools, and 177 Units of Support Services for Regular Education (USAER)s⁵

In February 2020, we toured the two school sites, and conducted interviews with directors, teachers, support staff, and foundation board members.

CAM Gallaudet

The *Centro de Atencion Multiple, Gallaudet*, is located in Jocotepec, Jalisco. Jocotepec is a town of approximately 38,000 people located on the shores of Lake Chapala, 70 km south of the city of Guadalajara.

In 1982, two retired Canadian women—teacher Jackie Hartley and nurse, Roma Jones—began to offer services for local deaf children who were not being schooled. Word spread about their project, and through private donations they were able to start a school in a former chicken coop until they were serving 30 children that were deaf and hard of hearing. The school was known as the Lakeside School for the Deaf (pictured below) and the current name, *Centro de Atencion Multiple, Gallaudet* includes the name of the famous American educator, Thomas Gallaudet, who started the first school for deaf children in the 1700's.

Hartley and Jones secured a grant through the Canadian International Development Agency which allowed them to operate the school and make gradual improvements. The Mexican government paid the salary of one teacher, and Canadian educator Gwen Chan volunteered to serve as director of the school. Chan, along with educators Tony Burton and Gene Key who also volunteered at the school, started a program to collect used hearing aids in Canada which they refurbished and distributed to community members. That program continues today, and a recent memorial was held for Key which brought the original staff members back together.

⁵ Guide to Education Centers in Mexico: <https://guia-jalisco.portaldeeducation.com.mx/education-especial-cam/jalsico/index-15.htm>



Lakeside School for the Deaf

During the late 80's-early 90's, there were five special needs schools in the state of Jalisco and two private ones, of which the Lakeside School for the Deaf was one. As word spread, children came from all over the region and would spend the week with local families. A nonprofit organization, formerly known as the Lakeside School for the Deaf Foundation, provided funds to cover transportation, food, and accommodations for students.

In 1994 the foundation could no longer sustain the school, which was forced to shut down amidst a severe economic crisis. Chan and the teachers appealed to the local government to fold the school under the newly implemented CAM model, which was building new schools and starting to cluster children with multiple needs by geographic area. Due to staff efforts, the school was re-opened a year later under management of the state, but the government required that they serve children with a variety of disabilities (not just those who are deaf or hard of hearing).

In 1995 the school was reconfigured as a CAM-Center for Multiple Attention. This meant that children were re-grouped by grade level rather than by disability need. New licensure requirements meant teachers now had to serve children with a greater variety of disabilities, which initially caused some upheaval. Several teachers resigned, including two clinical psychologists who were accustomed to working individually with children rather than larger groups of students. The school had previously provided speech and language therapy, but new government rules shifted these services to the Department of Health, and children who had needed this support were mainstreamed into the regular schools. A few other children were able to mainstream to local public schools with the support of USAER teams, but most remained at the school because they were unable to integrate, or were refused service by nearby schools.

As a new CAM, the government agreed to pay for building maintenance and teacher salaries, but any additional services and expenses would need to be covered elsewhere. The Lakeside School for the Deaf organization became the School for Special Children Foundation and they agreed to be responsible for maintaining and improving school facilities and providing any additional services. The foundation is composed of a board of directors, members-at-large and volunteers, many of whom are expat retirees living in nearby lakeside communities.



CAM Gallaudet classroom

Today, the Jalisco Department of Education and the federal government cover the salary of 11 classroom teachers, a communications teacher, psychologist, social worker, nanny, secretary, and school director. The School for Special Children non-profit group pays for all building operating costs, transportation, meals, and salaries for 5 additional staff: an audiologist, groundskeeper, accounts administrator and 2 cooks. Cooperation with other local charities provides additional support such as needed medical expenses, hearing aids, braces, and wheelchairs

Approximately 92 students currently attend the school and enrollment fluctuates between 80 and 104 children. There are a total of eleven classrooms in grades prek-9th grade. Each class has students with a variety of disabilities with an average class size of 11 students per level. The highest percentage of students have autism, followed by intellectual disabilities, Down syndrome, and low gross motor skills. The school also has the capacity to serve deaf and blind students.

In addition, there is an afterschool program provided by a deaf instructor who teaches children woodworking as well as other arts and crafts that are available for sale.



Elementary classroom

There is also an early intervention program for preschoolers and another for infants and nursing babies who have been identified as having developmental delays. Toddlers and infants attend daily classes with their mothers. These infants have been referred by local pediatricians to attend the school with their mothers in order to receive additional stimulation and therapy to support their learning.

There is one teacher for each grade level. Most teachers know some sign language and have advanced degrees in special education. The communications teacher uses a variety of assistive technology to support students, including digital tablets with pictures, scanning software and switches, and speech output for children who do not talk, or talk little.



Classroom for young children and mothers

The communication teacher and school director are very grateful to have access to these resources, and tell us that assistive technology has made an incredible emotional and academic difference in the lives of these children. In addition, community outreach is provided by Becky, the social worker, who transports children to optometry appointments, conducts parent education classes, and provides home visits.



Teachers at the school

Each student has a “psychoeducational support plan” and support team consisting of a teacher, parent, the director, social worker, psychologist, and communication specialist. The team meets initially to come up with a plan and meets annually to set goals and adjust as needed. During our visit, we met teachers at all grade levels as well as the rest of the support team members. We are invited into each classroom and were struck by the dedication that teachers show to their work and students, and their affirming description of children’s disabilities as an important aspect of diversity.



Author with teacher and social worker

Until recently, the school went to 6th grade, followed by vocational training for some of the students. Starting in 2019, as part of the national compulsory secondary school⁶ mandate, the school was extended to include secondary level grades through 9th grade for those students who are able to pass reading and writing tests. A few children (if high functioning) transition to public high school and are provided with continued support from the Gallaudet staff.

Children lacking the necessary academic skills at the secondary level are diverted to a workshop model and provided with vocational training. Vocational workshops include car-washing, beauty school, and custodial which includes a janitorial internship at the local mayor's office.

The first grade teacher, Gabriela was a wonderful source of information since she was one of the two original teachers hired when it was a school for deaf children. Gabriela's husband, Manuel, is the resident audiologist, and he has been at the school almost as long. Director Salvador Macias has worked at the school since it became a CAM in 1995. He only left the school during a seven year period when he served as a regional supervisor, and returned to lead the school four years ago. Having started in the special education field in 1986, Macias has experienced many policy changes during this time.

Director Macias is very well regarded by teachers and foundation members, and appears to truly enjoy his work with special needs children and their families. He also continues to serve as a regional coach to school leaders in the area and was recently honored to present on the history and services provided at Gallaudet at a national education conference

⁶ Secondary school in Mexico consists of grades 7-9



Teacher Gabriela

When asked about vocational and educational post -secondary opportunities, Macias says there are still few options, but notes there is a new special needs school for high school age children in Jocotepec. A few students that complete secondary school (as opposed to *Taller*, or Vocational Workshops), are able to transfer to local high schools or to the new center. Macias works at a local high school in the afternoons, where he serves as an USAER member, helping to integrate special needs students.



Author with school director

The director laments that universities are still not well prepared to serve special needs students. He tells us that only one student has managed to complete his bachelor's degree, a young man who attended the University of Guadalajara. While there, he faced unrealistic academic hurdles and lack of accommodations. He did manage to earn his fine arts degree, in large part due to strong advocacy and support from his parents, foundation members, and Gallaudet staff.

There is hope that two former students who are deaf will be also be able to complete higher education degrees. Both are daughters of the workshop teacher, Cesar, who is also deaf. One girl currently attends tenth grade, and the other has a finished high school and is preparing for college. Both girls were at the Gallaudet school for a short period before transitioning to regular schools with the help of USAER support staff.

Each municipality is required to provide services, but many of the families from the local community choose to send their kids to this school, because it's known to have the best services in the area, in large part due to the added financial support provided by the foundation. For example, the audiologist's salary is paid by the foundation. As a result, many parents from other communities come several times a year for audiology services and to service hearing aids (programming, batteries, audiograms). Although the school is located in the municipality of Jocotopec, the school pulls from the region, and children come from a variety of municipalities around Lake Chapala.

We ask Macias why the school is considered a model program and what the difference is between this CAM and others. He says the main difference is that the school has many more resources due to the support (such as audiologists and other support staff) provided by the foundation, which allows teachers to focus on their work. Macias says many of the other CAM schools have serious financial deficits which can limit their ability to support students adequately.

Macias also credits the experienced staff for their dedication, adaptability, and professionalism. When the school first opened, some teachers viewed this as a temporary job on their way to a more urban posting, but many stayed and put down roots in the community. The majority of teachers have been at the school twelve years or more, and this has generated a sense of teamwork and stability.

At first the school was not well known, but Macias believes that steady work and advocacy on the part of staff has helped to raise consciousness in the community about the needs and value of special needs students. Nowadays, the town of Jocotepec hosts a large celebration for CAM students on the day of the child, and several local businesses host holiday events and donation drives for the school. This increased recognition has also resulted in incremental government support. On our tour we observe construction of two new buildings for the secondary school, vocational workshops, new bathrooms, and a new playground-- all a result of recent government funding through the Funding provided through the 2014 Program for Inclusion and Educational Equity.



School Courtyard

Macias believes recent educational reforms have had other positive effects. He points out that all schools are now required to accept and integrate SPED students, and that CAMs are now required to use the same grade level texts and curriculum as regular schools. He also appreciates the greater degree of cooperation between teachers in special education and mainstream settings. He says there has been a recent shift in viewing student with disabilities as being incapable or as solely responsible for adapting. He describes a new vision, whereby the responsibility is now on the schools “to adapt and meet the needs students.”

Increased SPED guidance and more targeted professional development opportunities have been another effect of recent reforms. During one of our visits we briefly meet regional SPED director, Jose Antonio Hernandez Rivas, who was on site to provide coordination for bi-monthly professional development workshops for CAM and USAER personnel.

Macias’ primary goal at this time is to be able to complete the vision of providing services from infancy through secondary school, and to mainstream more children into the regular schools. When asked if this vision would be possible to achieve without financial support the private, he admits it would be difficult and take much longer.

He is proud of the long history and work achieved at Gallaudet, and is grateful to have resources that allow teachers to focus on instruction. In response to the positive reviews the school has earned, Macias modestly credits the foundation with 60% of praise for providing the necessary resources, and 40% to the staff for providing the services.

CITAC

The other special education site we visited was the *Centro de Integracion Tapalpa, Asociacion Civil* (CITAC). The center provides integrated services for people with disabilities and without, mostly from poor rural communities in the area. Tapalpa is a pretty colonial town of 19,500 inhabitants located two hours south of Guadalajara in the Sierra Madre Mountains.



The entrance to CITAC

The town is set in a rural area surrounded by small mountain villages and subsistence farms, but a number of wealthy residents from Guadalajara have second homes here. The town's name comes from the Nahuatl word, *tlapalpan*, meaning land of colors. The pre-Hispanic people living here used pigments derived from polychromatic mineral earth to dye cloth.

The area has always attracted artists, and one of the goals of CITAC is to serve as a cultural and creative resource to both disabled and nondisabled members of the community. CITAC was built adjacent to the local CAM-- special education school, in order to increase coordination and support of special needs students, but its mission is also to serve and integrate a much broader community.

The special education school was first started by Patricia Villalever, whose son suffered a horseback riding accident in 1992 which left him with a traumatic brain injury. Unable to find a program that could help their child, Villalever and her husband decided to start a school for him and other children who had special learning needs.

Villalever started a campaign to convince local authorities to build a CAM in the area, and in 1994, the people of Tapalpa donated the land and built a school with volunteer labor. Villalever thus became director of the first special education school in the area designed exclusively to serve children with learning and physical disabilities.

According to Villalever, prior to this period, many children were unable to attend school before the program existed, because "they didn't fit in and thought of themselves as useless to their families and communities" (quoted in Devlin, 2008).

One of the first students to enroll in the new school was a young girl who was rejected from other schools due to her violent behavior and the learning difficulties she experienced as a result of a brain lesion. At that time, it was not uncommon in small towns for girls like her to be stigmatized as being "crazy" and to be hidden away by their families.

The special education school filled a great void, but Villalever was concerned that disabled children still remained isolated from their peers, so she began a new campaign to build a more holistic resource center that could provide opportunities for greater integration. In 1996, Villalever formed CITAC as a non-profit foundation with the aim of raising funds to build a new center.

Six years later, in 2002, the CITAC building was completed with support of government grant money and private donors. It opened as a center designed to provide an education for all ages, with a mission to address the impacts of minimal disability access, discrimination, marginalization, poverty, child abuse, domestic violence, and addiction. New programs were designed to address social problems in the local area, as well as professional development workshops for educators, businesses, and other non-profit organizations with an emphasis on values and the arts.

The current director, Adriana Favela, gave us a tour of the school. She stressed that CITAC provides "integrated" services for people with and without disabilities, mostly from nearby poor

mountain communities. The building is very attractive and inviting--walls are made out of traditional adobe, with carved wood columns and red clay roof tiles. The entry is an open air lobby with comfortable seating and beautiful murals and inspirational messages that adorn the walls. Classrooms are organized around a grassy central courtyard, and next to each door is displayed a colorful sun that represents the school's core values with a focus on social and emotional learning. Each value, or sun, also serves as an instructional theme (See below).

Table 2
Core Values of the Eight Suns

 BRILLA CON TUS VALORES <i>"Let your values shine"</i>	 Education <i>"Study and prepare myself for a better life"</i>	 Honesty <i>"Speak and always act with truth."</i>
 Love <i>"Love myself, others, and nature."</i>	 Dialogue <i>"Instead of shouting or hitting, let's talk."</i>	 Justice <i>"Everyone is important and has equal rights"</i>
 Self- Management <i>"Learn to stand on my own."</i>	 Respect <i>"Treat others as I wish to be treated."</i>	 Solidarity <i>"Help others, known and unknown"</i>

Everywhere there is art-- one wall has a sculptural mural made out of adobe that displays images of an embryo and the 8 suns. An artist from Colombia donated his labor and talent to the school, out of appreciation for the school's work. There is also an architecturally striking auditorium, where assemblies, live performances, holiday events and movies are shown to the community.



Adobe Wall

Today CITAC serves over 300 students, with approximately 30 children ages four to adult in the school at any one time. The school is privately run, but attendance is free. The Mexican government has helped with construction costs and pays teacher salaries, but all other expenses are paid through grants and private donations.

Children identified as having developmental disabilities attend pre-school Monday-Thursday. There is also class four days a week for adults with intellectual disabilities known as “*Los Unicos*” (The Unique Ones). The Unicos classes focus on a variety of life and vocational skills as well as art and cultural activities.



Preschoolers

The day we visit, Los Unicos are making crafts out of recycled materials. The room is filled with long tables covered with newsprint, tools, paint, and a jumble of recycled materials. Plastic Coke bottles, aluminum cans, egg cartons and styrofoam trays are turned into *papelmalecho* (an invented word playing on *papelmache* or *papier mache*). The figures resemble the Mexican folk art tradition of *alebrijes*—fantastic creatures carved out of wood—but these paper versions are known as “*colibrijes*.”

Papelmalecho was developed by artist, Marco Canizales as a playful medium and form of art therapy that could be used to integrate people with those that experienced physical or social disadvantages. Canizales (pictured above) also serves as the artistic director of CITAC--he

developed the art and concept of the “Eight Suns” that serve as the foundation for social-emotional learning at the school.

Canizales has provided workshops in papelmalecho to many schools and communities throughout the region. He has also trained Los Unicos in this medium to help them foster their creative talent. The fantastic creations they make and sell in the school lobby provide each with some income and also help to fund the school.

We learn that Los Unicos love to have visitors, and when we enter the classroom they proudly show us their work and pose for a photograph. (see picture below). Two of the women in the papelmalecho class are former students who now serve as instructional aides. Remarkably, one of these women is the same girl with the brain lesion who was one of the first students to attend the school Villalever founded in 1994.



Marco Canizales

Los Unicos



**Making colibrijes
out of recycled
materials**

Favela says the main problem in the country today is not just serving children with disabilities, but providing access to “disadvantaged” students—those who are poor and under-served in crowded schools for nearby villages. For example, she explained that it is common for rural communities in the area to have only one or two teachers for all grade levels. Again, Favela stressed that programs are not just for students with disabilities, but “integrated” as reflected in the CITAC name. She explained that there are many nuances to this term, with a goal of “integrating disability into society, and integrating different values and emotional aspects of a human beings.” She adds that the pre-schoolers are also “learning to be separate from their parents and integrate with other children.”

CITAC is a nonprofit, and they rely on private donors. They apply for government grants for specific projects, like buildings and furniture, and for specific cultural events. Businesses also contribute funds. Tile squares in the entry display the names of donors.

The school provides transportation for children that need it and have two vans that are used to collect participants from rural communities in the area. Some of the staff who live in nearby towns also bring children to school with them.

Favela is particularly passionate about providing educational opportunities to help young women, and is very concerned about the low quality of instruction offered in many of the poverty stricken rural communities. Too often, she says, women from these villages are devalued and made to feel “stupid... believing they will always be poor, and inferior to their husbands or fathers who may beat them.” She wants them to envision a different future that is “peaceful and full of opportunity, where women have self-esteem and goals.” She emphasizes that everyone has a right to learn and achieve their goals.



A high school without limits student in the computer lab with Director Adriana

A recent project implemented by Favela, is called “high schools without limits” that funds low income rural women to finish high school online. It also provides scholarships through the University in Guadalajara, which provides access for those that want to earn online college degrees.

In addition, CITAC provides support to local students who need help with homework or internet access. Teachers offer lessons in computer skills, literacy, grammar and English. Students with and without disabilities are grouped together. There is also supplemental instruction in math and reading that integrates the curriculum with a focus on strengthening core values and self-esteem.

School psychologists provide mental health services and behavior management supports for students with or without disabilities. Favela mentions that some students with intellectual disabilities struggle with conduct issues, but she emphasizes that many other disadvantaged children also struggle as a result of childhood trauma related to extreme poverty and abusive family dynamics.

We toured the lawn and spaces and used for parent education, camps in the summer for children, as well as workshops and conferences for professionals. There is also climbing wall and other team building activities on site provided for groups of business and non-profit colleagues throughout the year. A variety of programs are offered for adults, children, and families, with overnight facilities available.

CITAC’s biggest challenge is finding consistent funding. They had two psychologists, but one just left and the other has to supplement their income with an independent practice. They are looking for more staff, but right now are running a deficit. They’ve also had to put a ballet and theater class on hold due to funding. Favela spends the bulk of her time pursuing grants and trying to develop new donor sources. While the school in Jocotepec draws from a large pool of philanthropically minded expats, there are few foreign residents in Tapalapa, and CITAC relies mainly on local businesses and wealthy patrons from farther away Guadalajara.

Conclusion

Similar to the US, in Mexico there is a growing focus on inclusion and recognition that students with disabilities represent diversity. This attitudinal shift is promising (although not fully realized) in both countries. Also, students with disabilities in Mexico are promised an education by law, just as they are in the US. A large number of children have attended schools in both countries, due to immigration and/or deportation. These children are our students—attending K-12 and going on to college. Understanding their experience is important to the work of all educators in the US.

Findings indicate that many advances have been made to increase access for children with disabilities in Mexican schools, as provided by the example of the two schools highlighted in this study. The teachers value their students and are dedicated to teaching them. They are educated in special education and receive ongoing professional development. The schools accomplish a variety of goals and provide several wrap-around services, including food, vocational training,

parent outreach, arts classes, and technology access and training. However, adequate funding remains a major challenge for all schools in Mexico, including these.

The partnership with funders and foundations, as well as reliance on grants, are key to the success of the schools in the study. Funding does not come solely from the Mexican government, and they are dependent on outside funding for the extra programming they are able to provide. And, as the directors and foundation members told us, continued outside funding can be tenuous. The director of CITAC told us she is concerned about the future of donations and grants. Similarly, the board members of CAM Gallaudet discussed with us barriers to sustaining their current level of fundraising.

Both schools, though, are praised for their programs and services. It should be noted that the schools were formed several decades ago by private citizens in response to a lack of services for students with disabilities, and were later able to expand and incorporate government funding. Parents, may rightly be concerned about finding schools such as these in Mexico that will adequately serve their children. Nonetheless, recent reforms and policies that emphasize equity for students with disabilities provide hope that there are an increasing number of such schools with good programs.

We would recommend that parents with special needs children start by locating one of the many CAM schools and USAER support services available in their region. There is a helpful government website which lists the address of every type of education center located within each Mexican state, including all special education services. It can be found at: <https://portaldeeducacion.com.mx>. Parents may want to visit some of these schools, and should also know that laws, and policies to implement these laws, are in place to guarantee educations for their children. And, as Director Salvador told us, training and professional development—with a diversity lens—is occurring for teachers across the country.

Mexico has the critical challenge, though, of improving coverage and quality for students across socio-economic backgrounds in all its schools. As part of these efforts, improving the quality and coverage of early childhood education needs to remain a priority so that all children can have a strong start. Mexico has made laudable and considerable efforts to strengthen the teaching profession and these efforts need to continue. Mexico needs to prioritize its education system—and it needs to provide sufficient resources to make this possible. This involves reflecting on how government money can be allocated more efficiently and equitably across schools.

It should be noted that the federal government is projected to spend 28% less on special education services in 2020 (Moreno, 2019). Of course, that budget projection did not take into account the additional economic effects of a global pandemic. It is predicted that the economic decline caused by the crisis will have a severe impact on education, which may set back gains the Mexican education system has made.

Stable government funding is key to the success of the schools in Mexico. Nonetheless, we are encouraged by observing schools like the ones in this study that have made great strides in their communities in recognizing that students with disabilities can succeed and integrated as valued

members of society. We also embrace the values and beliefs enacted through these models that honor disability as a form of human diversity that enhances our world.

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Pre-service Teachers' Attitudes Toward Including Students with ASD in General Education

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Abstract

The purpose of this study was to examine special education and general education pre-service teachers' attitudes toward including PK-12 students with autism spectrum disorder (ASD) in the general education classroom from an academic perspective. This study surveyed 160 undergraduate pre-service teachers (special education and general education) from a mid-size, northeastern state university's teacher preparation programs using an adapted version of the Attitudes Toward Inclusive Education Scale (ATIES). Significant differences were found in pre-service teachers' attitudes when examining the impact of the academic level of the PK-12 student with ASD, the academic program of study (e.g. special education vs. general education), and the level of undergraduate progress (i.e. year in undergraduate career).

Keywords: inclusion, inclusive education, pre-service teacher attitude, autism spectrum disorder (ASD), teacher preparation program, special education, general education

Pre-service Teachers' Attitudes Toward Including Students with ASD in General Education

Autism Spectrum Disorder (ASD) is a neurodevelopmental disorder characterized by social and communication challenges as well as restricted and repetitive behavior. It is considered a spectrum disorder whose origins are rooted in early brain development. Typically, autistic symptoms emerge between 12 and 18 months of age (NIH, 2017); however, sometimes these symptoms do not become apparent until the child enters school, as in the case of children with less severe symptoms of ASD (Nationwide Children's, 2020). In recent years, the U.S. has experienced a surge in children being diagnosed with ASD (Knopf, 2020). What was once considered a low incidence disability is now considered the fastest-growing developmental disability (CDC, n.d.). As of 2020, approximately 1 in 54 children are being diagnosed with an ASD (Cardinal, Griffiths, Maupin, & Fraumeni-McBride, 2021; Autism Society, 2020) due to various reasons such as broadening its definition and better diagnostic testing. It has been reported that an increase in ASD prevalence has occurred every year since the Center for Disease Control (CDC) began tracking it in 2000.

Because of the increasing number of children being diagnosed with ASD, educators are now being faced with how this increase is impacting the composition and success of today's classrooms. With appropriate special education services and supports, many children with ASD can be successfully educated in inclusive classrooms (U.S. Department of Education, n.d.).

Inclusive education occurs “...when students with special needs including disabilities are educated in neighborhood schools in age-appropriate regular education classrooms settings with non-disabled peers, and are provided with supports and instruction that assures their participation with their peers, while also meeting their individual strengths and needs (Chauhan & Mantry, p.1, 2018).

Other students with ASD will be educated in self-contained classrooms, separate schools, or residential facilities, primarily due to the unique challenges this disorder presents. In the U.S., however, *all* students with disabilities must be educated in their least restrictive environment (LRE). A student’s LRE is an educational setting where the student is educated with his typical peers to the greatest extent possible, with appropriate support services (IRIS Center, n.d.). Determining the appropriate placement for students with ASD is largely dependent on the student’s needs (Cappe, Bolduc, Poirier, Popa-Roch, & Boujut, 2017); however, the success with which their education is implemented relies heavily on the educational team that is supporting them.

Literature Review

Recently, schools have been acknowledging that teacher preparation is key to the successful inclusion of students with disabilities (Sharma, 2018). This refers to education coursework and related field experiences that develop the pre-service teacher’s ability to be an effective educator. Perceptions and attitudes surrounding the effectiveness of inclusive education are often amongst those concepts in which pre-service teachers develop opinions. Although there is existing research regarding pre-service teachers’ attitudes toward including students with disabilities, it does not target students with ASD, in particular. The literature that does exist regarding pre-service teachers’ attitudes toward including students with ASD has largely been conducted outside of the United States, where teacher preparation programs and inclusive education may look different (Alzahrani & Brigham, 2017). To illustrate, terminology surrounding inclusive practices can differ among countries as well as the manner in which students are identified or assessed as needing special education services (D’Alessio & Watkins, 2009).

Why is it important that we study pre-service teachers’ attitudes toward including students with ASD? Research indicates that teachers’ attitudes toward inclusion have been significantly shaped by their pre-service experiences (Miesera, DeVries, Jungjohann, & Gebhardt, 2019; Avramidis & Norwich, 2002; Shade & Stewart, 2001). “The shaping of positive attitudes toward students with disabilities is an important aspect of the education of pre-service teachers (Sze, 2009, p.53).” Therefore, one could derive that investigating pre-service teachers’ attitudes toward inclusion, coupled with the continually increasing prevalence of PK-12 students with ASD, would be meaningful in ensuring that educators are fostering positive attitudes regarding this educational trend in order to procure the best outcomes for these students.

As previously stated, there are only a few studies that pinpoint pre-service teachers’ attitude toward inclusion of students with ASD. In a study by Low et al. (2018) special education pre-service teachers were found to be less in favor of full inclusion of students with ASD in general education (i.e. students with ASD in general education for all subjects), when compared with general education pre-service teachers. In another study, Chung et al. (2015) examined pre-service teacher attitudes toward students with ASD and suggested that pre-service teachers

(general education and special education) possessed more negative attitudes toward students with ASD being included in general education classrooms. Further, another study on this topic suggested that pre-service teachers feel they have received sufficient schooling in inclusive practices, but lack the experiential learning to feel confident when teaching students with behavioral and social/emotional challenges (Al Shoura & Ahmad, 2020).

There is considerably more literature about attitudes towards inclusion once pre-service teachers become practicing teachers that warrants attention. Research suggests that teachers' attitudes toward inclusion have shown to be the strongest predictor of successful learning environments (Van Laarhoven et al., 2007; Avramidis & Norwich, 2002; Barton, 1992) and teachers with positive attitudes toward inclusive education are more likely to implement the necessary strategies to meet the diverse needs of their learners (Weber & Greiner, 2019). This is important as research indicates that one of the most important predictors of successful inclusion is the attitude of general education teachers (Ritter, Wehner, Lohaus, & Kramer, 2020). This attitude is often shaped during their undergraduate career and any information that investigators can gain related to pre-service teachers' attitudes could be valuable in enhancing the quality of education for students with ASD.

Purpose of the Study

The purpose of this study was to examine pre-service teacher candidates' attitudes toward including Pre-Kindergarten (PK) -12 students with ASD in general education classrooms *from an academic perspective* according to the following: 1) the level of academic performance of the PK-12 students with ASD; 2) the academic program of study (i.e. *major/minor degree programs*) and the level of academic performance of the PK-12 students with ASD; and 3) the academic level of progress (among special education pre-service teachers) and the level of academic performance of the PK-12 students with ASD. The research questions in each of those areas of inquiry for this study were as follows:

Level of Academic Performance of PK-12 Students with ASD

1. Does the current level of academic performance (i.e. *one year below grade level or two or more years below grade level*) of the PK-12 student with ASD impact the preservice teachers' attitude towards inclusion from an academic perspective?

Academic Program of Study and Level of Academic Performance of PK-12 Students with ASD

1. Does the first- or second-year pre-service teachers' academic program of study (i.e. *major/minor degree programs*) impact attitude towards inclusion from an academic perspective?
2. Does the first- or second-year pre-service teachers' academic program of study (i.e. *major/minor degree programs*) impact attitude towards inclusion from an academic perspective for students who are *academically one year below grade level*?
3. Does the first- or second-year pre-service teachers' academic program of study (i.e. *major/minor degree programs*) impact attitude towards inclusion from an academic perspective for students who are *academically two or more years below grade level*?

Level of Progress in Undergraduate Career and Level of Academic Performance of PK-12 Students with ASD

1. Does the special education pre-service teachers' academic level of progress in their undergraduate career (i.e. *first-/second-year and third-/fourth year*) impact attitude towards inclusion from an academic perspective?
2. Does the special education pre-service teachers' academic level of progress in their undergraduate career (i.e. *first-/second-year and third-/fourth year*) impact attitude towards inclusion from an academic perspective for students who are *academically one year below grade level*?
3. Does the special education pre-service teachers' academic level of progress in their undergraduate career (i.e. *first-/second-year and third-/fourth year*) impact attitude towards inclusion from an academic perspective for students who are *academically two or more years below grade level*?

Methodology

Participants

The participants for this study consisted of 160 undergraduate, pre-service teachers from a mid-size state university located in the northeastern part of the United States. Pre-service teachers who had taken a foundations of special education course (which is typically taken during the first or second year by most teacher preparation programs at the University) and an upper-level special education communications course (which is typically taken during the third or fourth year by special education majors or minors) were given the opportunity to participate in the study during the Spring 2019 and Fall 2019 semesters.

Participants were matriculating in one of the following types of programs:

1. A special education program, which is defined as being
 - a. enrolled in a dual special education teacher preparation program and general education teacher preparation program or
 - b. enrolled in a special education minor program whose majors vary
2. A general education teacher preparation program without a dual major or minor in special education, which is defined as being
 - a. enrolled in an Early Grades (PK -4) program;
 - b. enrolled in a Middle Grades (4-8) program;
 - c. enrolled in a Secondary Education (7-12) program; and
 - d. enrolled in a Music Education (PK-12) program

Participants who were enrolled in a special education program (N=106) were categorized into 2 different groups: 1) first- and second-year students (N=29); and 2) third- and fourth-year students (N=77) to differentiate between their level of academic progress (a foundations of special education course as compared to an upper-level special education communications course) (see Table 1). Participants who were enrolled in a general education program only (N=53) were

typically in their first and second year (N=46) and enrolled in a foundations of special education course (see Table 1).

Table 1

Frequency of Participants by Program and Level

Level of Progress	Frequency
First- and Second-Year Students in a Special Education Program	29
Third- and Fourth-Year Students in a Special Education Program	77
First- and Second-Year Students in a General Education Only Program	46
Third- and Fourth-Year Students in a General Education Only Program	7
Total	159*

* One participant enrolled in a special education program didn't indicate the year in undergraduate career

Instrument

The Attitudes Toward Inclusive Education Scale (ATIES) is an instrument that was developed to assess teachers' attitudes toward inclusive education (Wilczenski, 1992). The instrument measures physical, academic, behavioral, and social aspects of inclusion. It consists of sixteen items with each of the four dimensions being measured by four items. The instrument was validated on a representative sample of 301 in-service teachers and 144 pre-service teachers in New Hampshire. A principal component analysis was used to determine the construct validity of the instrument (Wilczenski, 1992), which then resulted in the 16-item instrument. Each of the hypothesized items loaded on each of the factors, as expected. The internal consistency reliabilities (coefficient alpha) of each of the four factors were adequate, ranging from .82 to .92. The intercorrelations between the factors ranged from .44 to .66. Wilczenski (1992) concluded that the ATIES is valid for measuring attitudes toward inclusion.

For this study, the investigators exclusively examined the impact of variables on the *academic factor*, which addresses attitude towards including students with ASD in inclusive classrooms, academically. As such, it was necessary for the investigators to only examine the following items on the ATIES that pertained to the academic factor:

1. Students with ASD whose academic achievement is 2 or more years below other students in the grade should be in regular classes
2. Students with ASD whose academic achievement is 1 year below other students in the grade should be in regular classes
3. Students with ASD who need an individualized functional academic program in everyday reading and math should be in regular classes
4. Students with ASD who are frequently absent from school should be in regular classes

The instrument required participants to rate the items on a Likert-scale of 1-6, with 1 representing *strongly agree* to 6 representing *strongly disagree*. For purposes of conforming to a more typical Likert scale (positive rating higher on the Likert scale and negative rating lower on the Likert scale), the values in the Likert scale were reversed in the analysis of the data.

Procedure

Participants completed the ATIES via the cloud-based platform, Qualtrics. They used personal devices including laptops, tablets, and smartphones to record their responses. Prior to completing the survey, participants voluntarily viewed two short videos depicting the characteristics of ASD, as some students had a clear understanding of the disorder, while others were still learning about the characteristics of ASD in their respective coursework. There was a 100% response rate on the ATIES. The researchers visited several foundations of special education classes and special education communication classes to discuss the study and to generate interest to participate in the study. As an incentive to participate, students were offered varying amounts of extra credit points by their professors. In addition, the study was advertised by exhibiting research posters throughout the university's education building.

Results

Level of Academic Performance of PK-12 Students with ASD

1. Does the current level of academic performance (i.e. *one year below grade level or two or more years below grade level*) of the PK-12 student with ASD impact the preservice teachers' attitude towards inclusion from an academic perspective?

As a means of identifying whether the level of academic achievement of the student with ASD (i.e. one-year below the current grade level or two or more years below the current grade level) impacts attitudes toward the inclusion from an academic perspective, a paired-sample t-test was used. The test showed a significant difference in means ($p=.000$) (see Table 2). Overall, participants were more willing to include students in the classroom who were academically one year below grade level over those who were academically two or more years below grade level.

Table 2

Attitudes Toward Inclusion based on the Student with ASD's Level of Academic Achievement

Level of Academic Achievement	Frequency	Mean*	Standard Deviation
Two or more years below grade level	160	3.33	1.26
One year below grade level	160	4.48	1.06

* $p=.000$

Academic Program of Study and Level of Academic Performance of PK-12 Students with ASD

1. Does the first- or second-year pre-service teachers' academic program of study (i.e. *major/minor degree programs*) impact attitude towards inclusion from an academic perspective?

As a means of identifying potential differences in attitude among first- and second-year pre-service teachers in a special education program as compared to a general education only program, an independent t-test was used. The means and standard deviations of the scores can be found in Table 3. There were no significant differences in variance ($p=.95$), but a significant difference in means was found between the groups ($p = .012$). Overall, first- and second-year general education only pre-service teachers had a more positive attitude toward inclusion.

Table 3
Attitudes Toward Inclusion Based on Program of Study

Program of Study	Frequency	Mean*	Standard Deviation
Special Education (Major or Minor)	29	13.69	3.07
General Education Only	46	15.48	2.86

* $p = .012$

- Does the first- or second-year pre-service teachers' academic program of study (i.e. *major/minor degree programs*) impact attitude towards inclusion from an academic perspective for students who are *academically one year below grade level*?

As a means of identifying potential differences in attitudes toward the inclusion of students who are academically one year below grade level among first- and second-year special education pre-service teachers as compared to first- and second-year general education only pre-service teachers, a two-sample independent t-test was used. The means and standard deviations of the scores can be found in Table 4. There were no significant differences in variance ($p=.933$) or means between the groups ($p = .097$).

Table 4
Attitudes Toward Inclusion of Students with ASD (One Year Below Grade Level) Based on Program of Study

Program of Study	Frequency	Mean	Standard Deviation
Special Education (Major or Minor)	29	4.10	1.08
General Education Only	46	4.50	0.93

- Does the first- or second-year pre-service teachers' academic program of study (i.e. *major/minor degree programs*) impact attitude towards inclusion from an academic perspective for students who are *academically two or more years below grade level*?

As a means of identifying potential differences in attitudes toward the inclusion of students who are academically two or more years below grade level among first- and second-year special education as compared to first- and second-year general education only pre-service teachers, a two-sample independent t-test was used. The means and standard deviations of the scores can be found in Table 5. There were no significant differences in variance ($p=.100$) or means between the groups ($p = .057$).

Table 5

Attitudes Toward Inclusion of Students with ASD (Two or More Years Below Grade Level) Based on Program of Study

Program of Study	Frequency	Mean	Standard Deviation
Special Education (Major or Minor)	29	2.76	0.91
General Education Only	46	3.22	1.05

Level of Progress in Undergraduate Career and Level of Academic Performance of PK-12 Students with ASD

1. Does the special education pre-service teachers' academic level of progress in their undergraduate career (i.e. *first-/second-year and third-/fourth year*) impact attitude towards inclusion from an academic perspective?

A two-sample independent t-test was used to compare the attitudes of first- and second-year pre-service teachers and third- and fourth-year pre-service teachers who were in a special education program. There was no significant difference in variance ($p=.053$). However, there was a significant difference in means ($p = .002$), with the means being greater for the third- and fourth-year students than first- and second-year students (16.68 and 13.69, respectively) (See Table 6). Overall, third- and fourth-year special education pre-service teachers had a more positive attitude toward inclusion.

Table 6

Attitudes Toward Inclusion Based on Academic Level of Progress

Academic Level of Progress	Frequency	Mean *	Standard Deviation
First- and Second-Year Students	29	13.69	3.07
Third- and Fourth-Year Students	77	16.68	4.05

* $p = .002$

2. Does the special education pre-service teachers' academic level of progress in their undergraduate career (i.e. *first-/second-year and third-/fourth year*) impact attitude towards inclusion from an academic perspective for students who are *academically one year below grade level*?

As a means of identifying whether the current level of education among special education pre-service teachers (i.e. first-/second-year students and third-/fourth-year students) impacts attitudes toward the inclusion of students who are academically one year below grade level, a two-sample independent t-test was used. There was no significant difference in variance ($p=.655$). However, there was a significant difference in means ($p = .000$), with the means being greater for the third- and fourth-year pre-service teachers than first- and second-year pre-service teachers (4.82 and 4.10, respectively) (see Table 7). Overall, third- and fourth-year participants had a more positive attitude toward inclusion than first- and second-year participants who were enrolled in a special education program.

Table 7

Attitudes Toward Inclusion of Students with ASD (One Year Below Grade Level) Based on Academic Level of Progress

Academic Level of Progress	Frequency	Mean	Standard Deviation
First- and Second- Year Participants	29	4.10.	1.08
Third- and Fourth- Year Participants	77	4.82	1.04

* $p = .000$

3. Does the special education pre-service teachers' academic level of progress in their undergraduate career (i.e. *first-/second-year and third-/fourth year*) impact attitude towards inclusion from an academic perspective for students who are *academically two or more years below grade level*?

As a means of identifying whether the current level of education among special education pre-service teachers (i.e. first-/second-year students and third-/fourth-year students) impacts attitudes toward the inclusion of students who are academically two or more years below grade level, a two-sample independent t-test was used. There was a significant difference in variance ($p=.001$) and a significant difference in means ($p = .000$), with the means being greater for the third- and fourth-year participants than first- and second-year participants (3.61 and 2.76, respectively) (See Table 8). Overall, third- and fourth-year special education pre-service teachers had a more positive attitude toward inclusion.

Table 8

Attitudes Toward Inclusion of Students with ASD (Two or More Years Below Grade Level) Based on Academic Level of Progress

Academic Level of Progress	Frequency	Mean*	Standard Deviation**
First- and Second-Year Participants	29	2.76	0.91
Third- and Fourth-Year Participants	77	3.61	1.42

* $p = .000$

** $p = .001$

Discussion

The purpose of this study was to examine pre-service teacher candidates' attitudes toward including PK-12 students with ASD in general education classrooms from an academic perspective according to the following: 1) the level of academic performance of the PK-12 students with ASD; 2) the academic program of study (i.e. *major/minor degree programs*) and the level of academic performance of the PK-12 students with ASD; and 3) the academic level of progress (among special education pre-service teachers) and the level of academic performance of the PK-12 students with ASD.

Impact of Level of Academic Achievement for the PK-12 Student with ASD

In evaluating pre-service teachers' attitudes, the first area of inquiry was to examine the level of academic achievement of PK-12 students with ASD. The researchers asked participants to

consider the inclusion of students who were academically one year below grade level and those who were academically two or more years below grade level. Overall, it was determined that pre-service teachers (special education and general education) were more in favor of including students who were academically one year below grade level. This finding is consistent with the existing research that indicates that teachers appear to be more receptive to including students with “mild” disabilities over those with more complex needs (Forlin & Chambers, 2011). Therefore, it can be determined that a relatively small academic delay is considered more conducive to successful inclusion than a more pronounced academic delay.

Impact of Academic Program of Study and Level of Academic Performance of the PK-12 Students with ASD

In further evaluating pre-service teachers’ attitudes, the researchers examined the impact of the academic program of study. The analysis yielded a significant difference between first- and second-year special education and first- and second-year general education pre-service teachers’ attitudes toward inclusion. It was determined that general education pre-service teachers were more favorable toward inclusion as compared to first- and second-year special education pre-service teachers. This finding is consistent with the existing research that general education pre-service teachers were more in favor of full inclusion for students with ASD than special education pre-service teachers (Low et al., 2018).

In examining the results, it is important to consider possible reasons why special educators demonstrated a less positive attitude than general educators. In this analysis, the researchers examined those pre-service teachers who were at the same level of education (i.e. first- and second-year students). Since this was the first special education course for all the students, their level of higher education instruction related to special education was similar. It is possible that previous life experiences that may have influenced their decisions to enroll in a special education program may have also influenced their attitudes toward the inclusion of students with ASD. It may be possible that they have some type of experience that may have led to preconceived notions surrounding the inclusion of students with disabilities. For example, they may have a sibling or family member with a disability that helped to shape their opinions about education. As another example, it’s possible that their interest in special education may have stemmed from educational experiences related to special education (e.g. peer mentoring programs) that they may have been involved in.

When all pre-service teachers who were first- and second-year students (special education and general education) were asked to consider PK-12 students with ASD who were both academically one year below grade level and two or more years below grade level, no significant difference in attitudes was found. Since this is an early course in their curriculum, it was possible that they have not developed discerning attitudes about the level of severity related to ASD.

Impact of Level of Education in Conjunction with the Level of Academic Performance of the PK-12 Students with ASD

Lastly, the researchers explored the attitudes of first- and second-year as compared to third- and fourth-year special education pre-service teachers. The purpose was to identify the possible

impact of increased knowledge in the area of special education (obtained from additional coursework and field experiences) on their attitudes towards inclusion. It was determined that there was a significant difference in their overall attitudes toward inclusion as well as significant differences in attitude based on the severity level (i.e. academically one year below grade level vs. academically two or more years below grade level). Third- and fourth-year pre-service special education teachers were significantly more favorable for all conditions. This indicates that as special education pre-service teachers progress through their academic program, and subsequently gain more knowledge on inclusion and students with ASD, their attitudes toward inclusion from an academic perspective becomes more positive. It was possible that increased knowledge (e.g. characteristics of ASD, inclusion practices, evidence-based instructional and assessment practices, and field experiences) help to improve the confidence in the educational community to provide a successful education for PK-12 students with ASD in inclusive settings.

Limitations

While the findings of this study were informative and beneficial to our knowledge surrounding pre-service teachers' attitudes toward students with ASD in general education, there were limitations of the study. One limitation of this study is that participants were solely from one institution and were primarily white, middle-class, females ranging from 18-22 years old, so generalizability should be taken with care. A second limitation is that the impact of education (i.e. those in their first-/second-year vs. third-/fourth-year) on general education pre-service teachers was not examined. A third limitation of this study is that it examined only the academic factor of including students with ASD in general education. A fourth limitation of this study is that pre-service teacher candidates likely have a limited depth of knowledge about the characteristics of students with ASD and how these characteristics might impact instruction and educational placement.

Implications for Future Research

The outcomes of this study offer several possibilities for future research. First, it would be beneficial to expand the research sample to include more diverse teacher education populations. This study's sample included primarily Caucasian females between the ages of 18-22. Although this gender/race/age combination is representative of the majority of pre-service teachers enrolled in these particular teacher preparation programs, a more diverse sample may be indicative of other teacher preparation programs whose pre-service teachers represent various genders, races, and ages. Second, it would be advantageous to examine the impact of education on general education pre-service teachers. Third, it would be beneficial to examine other factors related to including PK-12 students with ASD (e.g. behavior or social) that may affect pre-service teachers' attitudes toward including students with ASD.

Conclusion

This study sought to examine pre-service teachers' attitudes toward the inclusion of PK-12 students with ASD in general education from an academic perspective. Ultimately, the academic program of study and level of undergraduate progress impact pre-service teachers' attitudes, as does the level of academic performance of the PK-12 student with ASD.

Although it is the role of the PK-12 student's multidisciplinary team to decide the most appropriate placement for a student with ASD (e.g. inclusive classroom, self-contained classroom, separate school, or residential facility), many multidisciplinary teams opt for an inclusive setting. As was stated earlier, teachers' attitudes can be a strong predictor of student performance (Van Laarhoven, et al., 2007; Avramidis & Norwich, 2002; Barton, 1992). The more positive the teachers' attitudes toward the inclusion of students with ASD, the higher the likelihood that students with ASD will have a positive and effective educational experience. Therefore, a primary role of teacher preparation programs should be to foster positive attitudes toward the inclusion of students with ASD, as this population represents the fastest-growing developmental disability in our schools today.

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A Competency-Based Education Case Study: A Mathematics Intervention for a Five-Year-Old with Autism Spectrum Disorder (ASD)

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Abstract

Early mathematics achievement is a significant predictor of future math learning. Current research shows that teachers lack knowledge in teaching methods for children with autism spectrum disorder (ASD). Specifically, research focusing on teaching mathematics in ASD is limited. A competency-based education (CBE) mathematics intervention was developed for a five-year-old boy with ASD in a naturalistic setting in his kindergarten and conducted as a single case study. The intervention was developed according to the specific needs of ASD, utilizing direct, embedded, and kinesthetic instruction. It incorporated support and ongoing assessment for teaching the standards-based mathematics curriculum. Two aspects were analyzed in the study: a) the kindergarten teacher's process of intervention building and b) how this intervention advanced the student's mathematical skills. The clinical and theoretical implications regarding the importance of an intensive, structured mathematical intervention for young children with ASD are discussed.

Keywords: autism spectrum disorder (ASD), competency-based education (CBE), mathematics intervention

A Competency-Based Education Case Study: A Mathematics Intervention for a Five-Year-Old with Autism Spectrum Disorder (ASD)

Preschool cognitive skills are among the most robust early predictors of elementary and high school academic achievement, including mathematics, for typical development and autism spectrum disorder (ASD) (Kim et al., 2018). Mathematical skills are critical for children's future success in school; therefore, kindergarten is a significant time for developing sound mathematical conceptual foundations (Green et al., 2018; Shanley et al., 2017). While there is an increase of literature on mathematics regarding young children with typical development, there is a paucity of research related to young children with disabilities in mathematics in general (Green et al., 2018) and specifically concerning ASD (Oswold et al., 2016). The current study provides insights into a successful teaching approach with a high-functioning, verbal 5-year-old with ASD.

Mathematics is an inseparable part of daily life and it is essential to develop and foster this skill at an early age (Organization for Economic Cooperation and Development [OECD], 2019). One

of the essential issues in the mathematics field is solving verbal problems (National Council of Teachers of Mathematics [NCTM], 2000), which is a significant component of the mathematics curriculum both in kindergarten and in school. Mathematical problem solving can help the pupil apply mathematical concepts and provides tools for solving problems encountered in daily lives, as expected of a citizen in his/her personal life (OECD, 2019). Research has shown that this issue is complex for children because it requires cognitive and metacognitive skills (NCTM, 2000). Solving mathematical word problems in kindergarten is one of the most important ways to foster mathematics comprehension (Shanley et al., 2017). From a developmental perspective, children first attempt to model the mathematical operation with concrete manipulatives and then with drawings presented in the problem, thus progressing from the concrete to the abstract level (Jones & Tiller, 2017). A common representational strategy is the number line, used frequently to facilitate whole number operations. It is helpful because it creates a clear visual representation of the relationship between the numbers, facilitating mathematical computation (Georges et al., 2020). Appropriate and evidence-based strategies for teaching mathematics to young children with ASD (Oswold et al., 2016) are scant.

Mathematics in ASD

ASD is a neurobiological disorder that significantly impairs children's social interactions, verbal and nonverbal communication, and behavior (*DSM-5*, American Psychiatric Association, 2013). Previous research has demonstrated that the typical cognitive profile in ASD, characterized by weak central coherence, deficits in theory of mind, language impairments, and executive dysfunction, may affect children's academic and mathematical performance (Titeca et al., 2015). The mathematics achievement profile of students with ASD is highly variable, revealing patterns of both over and underachievement (King et al., 2016). A comparative study found that students with ASD perform significantly worse than students with learning disabilities on calculation and applied mathematics problems (Wei et al., 2013). This finding concludes that teachers will require guidance in targeting and teaching mathematical problem-solving skills within ASD (King et al., 2016). Another study that assessed the proportion of adolescents with ASD who demonstrate difficulties in math problems found that 22% of the ASD sample evidenced a mathematics learning disability (Oswold et al., 2016).

Many teachers of children with ASD report having challenges, particularly concerning the academic aspects related to teaching. Consequently, children with ASD often do not receive the required instruction and their academic potential is not fully realized (Knight et al., 2019). A significant impediment is teachers' lack of knowledge regarding appropriate strategies for teaching children with ASD (Kim et al., 2018) alongside the need to choose the most appropriate strategy or intervention to meet the needs of the student's disability and, at the same time, to fit the task requirements. Only limited research has focused on identifying the best practices and instructional formats for teaching mathematics in ASD in general (King et al., 2016) and specifically for preschoolers (Su, Lai, & Rivera, 2010).

Instructional Formats

Competency-Based Education (CBE) is a personalized learning system where students master specific knowledge and skills at their own pace. It is based on mastery of clearly defined competencies or skills and provides students with opportunities to develop competencies, building on their previous knowledge and abilities (Lenski et al., 2019). Student assessment is a principal element of CBE (Gunnell et al., 2016). The learning experiences of children with ASD

should be designed to actively engage their attention, help them connect new experiences with existing knowledge, teach within developmental sequences, and systematically increase the complexity of the learning experiences (Schreibman et al., 2015).

Instruction: To date, three instructional formats have been suggested in the literature as possibly offering the best practices for children with special needs: direct instruction (Stockard et al., 2018), embedded instruction (Jimenez & Kamei, 2015), and kinesthetic instruction (Gardner, 2006).

Direct instruction (DI) is a teacher-centered instruction format that focuses on distinct behavioral and cognitive goals and outcomes, including short, clear, sequenced instructions, reinforcement, and error correction procedures (Stockard et al., 2018). DI has been implemented successfully for mathematics among preschool-age children with ASD in one exploratory study (Su et al., 2010).

Embedded instruction (EI) is used for teaching skills during established routines within natural settings (Jimenez & Kamei, 2015). It promotes the child's engagement in learning activities by identifying times and activities that can be used to implement learning tasks. EI is an evidence-based approach that has also been found to be effective in mathematics at the preschool age for children with ASD in an exploratory study (Su et al., 2010).

Kinesthetic instruction (KI) is an interactive approach that involves body movements to enhance learning. According to Gardner's (2006) theory of multiple intelligences, action and activity are essential for children's learning and therefore movement can be ascribed to every idea, lesson, and concept. Many students benefit from KI when learning mathematics, as movement activities advance a more profound, holistic understanding of the subject taught (Smith et al., 2014). To our knowledge, no study to date has examined the use of KI in mathematics training for children with ASD in general or specifically at the preschool age.

Assessment: According to the National Center for Learning Disabilities (NCLD, 2014), CBE is typified by the assessment, support, and monitoring of individual students' progress as they work toward meeting their academic targets. CBE recognizes that all students have strengths and challenges and learn best at their own pace, sometimes with varying support. The process often includes an ongoing assessment. The degree of support is adapted to the student's level of understanding: increasing support when the student shows difficulty and decreasing support when the student succeeds (NCLD, 2014).

Techniques for supporting children's motivation and performance can include varying teaching stimuli, prompting (i.e., modeling, visual and verbal support), child-preferred activities, and incidental teaching strategies (Schreibman et al., 2015). Many students with ASD benefit from interventions that include prompting, in which the child learns to respond independently as the prompts fade (King et al., 2016). Interventions in the natural environment are successful when learning opportunities are structured appropriately (Schreibman et al., 2015). The support techniques used in this study will be discussed below (see Mathematics Intervention Program).

Current Study Objectives

The number of students with ASD is increasing as is their heterogeneity, and teachers would benefit from effective competency-based mathematics interventions. Considering the paucity of available research regarding such interventions for kindergarten-age children with ASD (Oswold et al., 2016), the primary aim of this case study was to develop and examine the efficacy of an intensive competency-based mathematical intervention based on the Preschool Standards Mathematics Program (Israeli Ministry of Education, 2007). Competency-based instruction is closely aligned to educational standards which define the specific competencies each student should have (Lenski et al., 2019). This standards-based program corresponds to children's developmental rather than chronological age and is appropriate for children with ASD in inclusive and specialized settings. This program accords with the view that multifaceted interventions (i.e., an intervention with two or more components) are more effective than single-component interventions (Squires et al., 2014). The competency-based intervention centered on three instructional approaches (DI, EI, KI) combined with appropriate support for teaching the standards-based mathematics curriculum. The following research questions were posed:

1. What is the kindergarten teacher's intervention-building process in general, and how does it support the principles of competency-based teaching?
2. How does the multifaceted intervention advance the student's mathematical skills, specifically his/her ability to solve mathematical problems?

Method

The current study was designed as a qualitative exploratory case study emphasizing the various choices and decisions the researchers undertook during the process of research. A case study depicts a single instance (i.e., a child, a class, a school), providing a unique example of real people in a realistic context while investigating and reporting the complex dynamics and unfolding interactions of events (Baškarada, 2014).

Participants

The participants in the current study included Dan (pseudonym) and his kindergarten teacher (third author). Dan (age five years; four months) was diagnosed at age 3 with ASD, but without an accompanying intellectual or language impairment, according to *DSM-IV-TR* criteria (American Psychiatric Association, 2000). The diagnosis was based on two independent professional evaluations (psychiatrist and neurologist) in line with the Israeli Ministry of Health and Ministry of Education guidelines. He had no other diagnoses, and IQ scores were unavailable to the researchers. Based on his ASD diagnosis, he was entitled to special education granted by the Ministry of Education's official entitlement committee. This was his second year in a self-contained kindergarten classroom for children with ASD of heterogeneous cognitive levels. The initial intervention assessment showed that his basic mathematical abilities were according to those expected at his chronological age: he succeeded in counting forwards (1-19); backward (6-1); counting objects (up to 10); reading numbers (1- 10), and perception of quantity (1-4). His main difficulty was problem-solving in general and, specifically, understanding the meaning of addition and subtraction.

The teacher (age 50) has been a kindergarten teacher for children with special needs for 25 years and children with ASD for the past five years. She is currently finishing her master's degree in special education. Before the study, the first author, an expert in mathematics for children with special needs, instructed the teacher regarding the mathematical concepts. The second author, an expert in ASD, supported the teacher regarding the specific instruction methods, conceptual underpinnings, and support techniques. Both the first and second authors guided the teacher throughout the intervention.

Naturalistic Setting

The study took place in an ASD kindergarten classroom for eight students in a middle-class city in central Israel. The study was planned according to the World Health Organization's (2017) guidelines for participation – involving life situations and actions in the actual environment rather than a standardized evaluation setting. The teacher's dual role as a direct interventionist and research team member enabled intervention implementation in a natural adult's natural setting, in contrast with laboratory settings or unfamiliar researchers (Kaluzeviciute et al., 2021). The naturalistic kindergarten setting also conforms to intervention research regarding children with ASD which found that teaching in natural environments yields better generalization (Schreibman et al., 2015).

Mathematics Intervention Program

The intervention was designed according to the CBE principles in which assessment, support, and monitoring of students' progress (NCLD, 2014) were implemented throughout. The intervention was planned in accordance with the naturalistic setting and the daily kindergarten schedule, based on the teacher's ongoing assessment of the program. It implemented teacher-student engagement activities transformed into motivating routines (Schreibman et al., 2015). Sessions took place twice weekly for eight weeks (16 sessions, approx. 30 min. each) and ended when the teacher saw that the student had achieved the mathematics objectives. Each session included 3 to 4 different mathematical word problems which were taught according to the different instructional methods (DI, EI, KI). The teacher incorporated concrete manipulatives (i.e., blocks and toys), which are crucial elements of mathematics education (Jones & Tiller, 2017). The instruction was implemented ad hoc, guided by initial and periodic diagnostic assessments (see Table 1). Support throughout the intervention was adjusted according to the learning opportunities presented (Schreibman et al., 2015).

Direct instruction (DI). The DI method was implemented individually in the kindergarten's math center. Following DI principles, the teacher presented each topic (e.g., addition) and its relevance to everyday life at the beginning of each session. When teaching each word problem she stated the instructions clearly.

Embedded instruction (EI). The EI method was implemented in various locations and contexts around the kindergarten (i.e., building blocks center, nature walks, the playground and, at times, during involvement in peer activity). During each session the teacher posed word problem questions related to the learning center or activity. For example, at snack time the children ate marshmallows and the teacher asked, "You had three marshmallows but ate one. How many do you have left?"

Kinesthetic instruction (KI). The KI method was implemented by focusing on the student's movement around the kindergarten in general, delivered individually and at the number carpet in particular. The number carpet displayed the number line from one to ten, each number printed on a different color stripe. Like the number line, the number carpet created a clear visual representation of the relationship between the numbers (Georges et al., 2020). The carpet, however, had the didactic advantage that the student could use it to solve the given math problems by jumping from stripe to stripe, thereby physically acting out the meaning of the problems presented rather than merely using the abstract representation of the number line.

Support. The support varied and was adjusted according to the learning opportunities presented (Schreibman et al., 2015):

Modeling. Modeling is often used as a specific prompt strategy that demonstrates the target skill the child is expected to imitate. The teacher visually showed the student how to solve the mathematical problem and verbally prompted him to imitate her every move.

Modeling with generalization. This support includes modeling with a degree of generalization for novel problems, in line with generalization as a crucial aspect of teaching (Tzanakaki et al., 2015). The teacher demonstrated how to solve a mathematical problem and asked the student to solve a different version of the problem.

Verbal support. Verbal support is the most common support in education, in line with the Vygotskian concept (Vygotsky, 1986) that language (particularly speech) is fundamental to children's cognitive growth. The teacher gave verbal prompts when necessary.

No Support. The teacher presented mathematical problems without providing any support. In these instances the student completed the problems independently.

Assessment Measures

Data were gathered from three different sources to ensure the triangulation of data sources and to reduce researcher-participant bias (Baškarada, 2014):

Mathematical assessments. These assessments (see Table 1) were based on the Israeli Preschool Mathematics Program (2007) and were conducted at three intervals via DI.

Initial assessment. An informal assessment was conducted prior to the intervention to determine the student's mathematical abilities and choose the appropriate topics for the intervention. The assessment included counting forwards, backward, counting objects, reading numbers, perception of quantity, the meaning of addition as adding, and the meaning of subtraction as omission with concrete manipulatives. Verbal prompts and modeling were given throughout the assessment. The student completed the assessment in a single session.

Intermediate assessment. The diagnostic assessment conducted during the eighth session of the intervention aimed to determine the student's gains after learning addition and subtraction separately. He was asked to solve an addition problem and a subtraction problem. The second stage of the intervention program was adjusted according to the results of this assessment.

Final assessment. The final diagnostic assessment was conducted to assess the student's mathematical achievements following the completion of the intervention. He was asked to solve two addition and two subtraction problems in alternating order.

Videotaped documentation of sessions. All the sessions, including the mathematical assessments, were videotaped by the kindergarten teacher or the teacher's aide for later transcription and data analysis.

Reflective journal. The teacher wrote a reflective journal involving her thoughts, feelings, reactions, and questions. A reflective journal creates transparency in the research process, making the decision-making processes visible including the thinking, values, and experiences behind those decisions. When writing, the connections between practical experience, theoretical knowledge, and the writer's own more comprehensive experiences are shown (Bashan & Holsblat, 2017). In the current study the teacher explored and covered issues that arose during the assessments and intervention. It included her subjective thoughts and reflections concerning the student's abilities, difficulties, and development, alongside her own dilemmas and conflicts. To avoid participant-researcher bias, reflective discussions based on the journal were conducted between the teacher and the second author, thus examining and modifying the teacher's assessments and decisions.

Procedure

In line with the researchers' institutional requirements, ethical approval for the project was obtained. The student's parents gave written consent for his participation and exit options from the intervention were possible upon the child or parent's request at any time. Although some of the activities during the embedded instruction occurred during involvement in peer activity, no data involving the peers were recorded.

Data Analysis

Analysis of the data from the reflective journal and the video transcripts followed qualitatively analyzing behavioral data to assess the teacher's intervention-building processes and the student's gains. Data were analyzed in two steps, according to the research questions. To prevent researcher bias, the coding process involved the first and second authors who rated the data. They read all the data in two waves, each focusing on different content: the intervention-building design and the student's math skills. Both were analyzed in relation to the instructional methods (DI, EI, KI) and support type. The data were coded and categorized through careful reading and rereading. Themes were not structured ahead of time but were developed from the data as it was obtained. The teacher analyzed the mathematical assessments ad-hoc.

Results

The analysis involved two major steps. The first step was the teacher's continual process of construction and adjustment according to the diagnostic assessment. The second step examined the student's mathematical development. Both were analyzed according to a) the instructional methods and b) the type of support.

Step 1. Intervention Structure

The first step of the analysis examined the teacher's evolving intervention-design process. This step shows how she adjusted a) the curriculum contents, b) the intervention's structure, c) the instructional methods, and d) the type of support.

The intervention's curriculum contents. When planning the mathematical topics for the intervention, the teacher's initial reference points were the student's mathematical abilities and difficulties as seen in the initial intervention assessment. His main difficulty was problem-solving - understanding the meaning of addition and subtraction. Accordingly, the teacher chose this as the mathematical topic for the intervention:

He did not understand the meaning of the mathematical operation and repeated math questions without solving them. It seems that Dan understood that he had to find an amount because I used the phrase 'how much?' but he did not know how to perform the mathematical operation and instead merely repeated the question and numbers that I asked. Even when I modeled the solution, he seemed confused (RJ-0⁷).

After Dalia decided on the mathematical topic, she contemplated which mathematical operation should be taught first:

I will teach each operation separately. I believe that alternating between them will be too difficult for Dan. After he will learn them separately I will integrate the two. I'll start with addition. I saw that it was more intuitive for him and that he was more attentive to my support, as opposed to subtraction (RJ-0).

Intervention structure. Dalia did not decide in advance the number of sessions for each mathematical operation, nor when the intervention would terminate. Rather, when she saw that he could solve two mathematical problems independently, she decided to advance to the next operation – subtraction or the integration of addition and subtraction – or to conclude the intervention. Dalia also did not plan the exact duration of the sessions in advance but rather depended on Dan's ability to cooperate. "I'll plan five questions for each session. I'm not sure he will be able to solve them all. It depends on his ability to cooperate, since I don't want him to become frustrated". (RJ-0).

Instructional methods. Next, Dalia chose the instructional method. She took into account her prior acquaintance with Dan, including his particular needs and abilities, and her theoretical knowledge regarding best practices in teaching children with ASD.

It is important to find teaching methods that will interest Dan and arouse his motivation. I know that he needs structured teaching, and it is important for the contents to be relevant

⁷ In reporting the results here, we use the following 2-part coding system: (a) the data source as either "RJ" for the teacher's reflective journal entry written after a particular session or "Vid" for the video transcription of a session's events (either training or assessment session); (b) the digit is for the session number (see Table 1). Thus, the current RJ-0 code was an excerpt from Dalia's reflective journal entry following the pre-intervention assessment.

to his areas of interest. It is important for some of the learning to be incorporated in his regular schedule, and that he will be active. Otherwise he will lose interest. I will discuss this with my mentor (RJ-0).

Table 1

Each Session's Instructional Method, Subject, and Assessment

Session	Instructional method(s)	Mathematical subject(s)
0	<i>Informal pre-intervention assessment</i>	<i>Addition, subtraction</i>
1	Direct	Addition
2	Embedded	Addition
3	Embedded	Addition
4	Direct	Addition
5	Embedded	Addition
6	Direct	Subtraction
7	Embedded	Subtraction
8	<i>Intermediate diagnostic assessment</i>	<i>Addition, subtraction</i>
9	Kinesthetic	Addition, subtraction
10	Kinesthetic, direct	Addition, subtraction
11	Embedded	Addition, subtraction
12	Embedded	Addition, subtraction
13	Kinesthetic, direct	Addition, subtraction
14	Direct	Addition, subtraction
15	Embedded	Addition, subtraction
16	<i>Final diagnostic assessment</i>	<i>Addition, subtraction</i>

Dalia chose to start with DI and EI. The DI will relate to "Dan's need for structured teaching" (RJ-0), and the EI to his need for "relating to Dan's everyday schedule and interests. Thus, I can teach him without him feeling that it is formal instruction. The combination of both teaching methods seems to be the most appropriate for Dan" (RJ-0). Dalia chose to start the first session with DI and to continue according to the naturalistic setting and the daily kindergarten schedule. "I'll start with DI since it is systematic and enables structured teaching. I'll start with balloons because Dan really likes them" (RJ-0).

Support type. Dalia adjusted the type of support according to the learning opportunities she presented. "Since I believe flexibility is the most appropriate for Dan, I will see which prompts will be the best for him during the sessions" (RJ-0). Throughout the intervention, Dalia used varying degrees of support in response to the level of understanding that Dan demonstrated.

Step 2: Dan's Mathematical Development

The second step of analysis examined Dan's mathematical development regarding a) the instructional methods, and b) the type of support.

Instructional methods. Dalia began with DI and Dan worked well with it, "Dan cooperated and enjoyed the session. In the next session, I will incorporate EI. I hope that Dan will still stay attentive to the process" (RJ-1). After the second session Dalia chose to continue with EI,

according to the naturalistic schedule planned for Friday. "I will teach Dan via EI on Friday because he really likes the Friday sing-alongs for the Sabbath" (RJ-2).

After the intermediate diagnostic assessment of the 8th session, Dalia saw that Dan could not solve addition and subtraction problems when they were presented alternately. She decided to incorporate KI into the intervention, alongside DI and EI, as an additional instructional method to help Dan differentiate between the meaning of addition and subtraction:

As I thought about Dan and what could help him, I thought about movement and how much he enjoys it. I started reading theoretical and practical research regarding intervention for young children and children with special needs, and I learned about KI. I am sure that incorporating it will really assist Dan (RJ-8).

She decided to have Dan jump on the numbers carpet and, indeed, it made a difference: "I was pleased to see Dan understand. It seems that jumping really helped him. It appears that the kinesthetic aspect involving spatial orientation facilitated his ability to differentiate between addition and subtraction. Addition when he jumps forward and subtraction when he jumps back. It is a good start. In the future, I will incorporate DI and KI" (RJ-9).

At the end of the intervention, Dalia expressed her satisfaction at incorporating all three instructional methods: "I believe that KI helped Dan understand, and the interaction between KI, DI, and EI was really successful" (RJ-15).

Support type. Although the amount of support varied, Dalia implemented three levels of support during the intervention:

The highest level (modeling). In the first session Dan needed substantial support in order to succeed. Dalia modeled each mathematical operation, thus engaging his attention. After watching her, Dan managed to solve the same problem by imitating her actions. Dalia utilized real inflated colorful balloons in this first session (Vid-1):

Dalia: I'll show you a story about balloons, and then **you** will show **me** the story. You have 1 balloon and I'll give you another balloon. We want to find out how many balloons you have together. Come see: Here is your balloon. Now, I'll take 1 **more** balloon from the box and give it to you. How many balloons do you have?

Dan: [counts] 1,2.....

Dalia: Now it's your turn to show the story. Dan has a balloon, and Dalia gave you another balloon. How many balloons do you have? Show me the story as I did it.

Dan: One balloon for Dan [takes a balloon].

Dalia: Correct. Now you need another balloon. What do you need to do? [points at the box]

Dan: Another balloon [takes one].

Dalia: Good! Another balloon. How many balloons do you have?

Dan: 2.

Dalia: Correct! 1 balloon and 1 more are 2 [writes $1 + 1 = 2$].

Dan: [reads] $1 + 1 = 2$.

In her journal entry after this first session Dalia wrote "Imitation and the concrete objects helped Dan understand the mathematical operation of addition. I will continue to model the problems and incorporate generalization. I hope that he will succeed" (RJ-1).

Moderate level (modeling and generalization). Dalia used modeling and generalization to expand Dan's existing knowledge. For example, in Session 9, Dalia began with imitation and immediately expanded the support to imitation and generalization. When she exposed Dan to the "number carpet" for the first time, Dalia modeled an addition problem ($3 + 1 = 4$), after which Dan was asked to stand on the carpet himself and to solve a different addition problem ($4 + 2 = ?$), thereby generalizing the principles that Dalia modeled:

Dalia: You have 4 apples. Where should you stand?

Dan: [runs to the number 4]

Dalia: And then you get two more apples. So how many apples did you get all together? To find out the answer, should you jump forward or back?

Dan: Forwards.

Dalia: how many times do you need to jump forwards?

Dan: Two (jumps forwards and says) 6

Dalia: Good. $4 + 2 = 6$. What did you do? Addition or subtraction? Did you add more or take away?

Dan: More.

Dalia: So what did you do?

Dan: Addition. (Vid-9)

Satisfied with Dan's generalization, Dalia wrote "imitation and generalization really assist Dan. He still needs a lot of support, but he really generalized what I showed him" (RJ-9).

The lowest level (verbal support). Dalia used verbal support to increase the complexity of the learning situation. This support included verbally posing a mathematical question and letting Dan use concrete aids to solve the problem without modeling. During the fourth session Dalia wrote "Dan entered the kindergarten and immediately went to the building blocks center. He started to build a tower, and I thought it was a wonderful opportunity to work with him on addition, so I joined him" (RJ-4).

Dalia: I will tell you a story. At the kindergarten, the children are playing with the building blocks. The teacher gave one child 2 blocks. Then she gave him 3 more blocks. Show me the story I told you, just as you did with the balloons and the stickers. Do you remember?

Dan: Yes.

Dalia: The teacher gave 2 blocks.

Dan: [takes 2 blocks]

Dalia: And then gave him 3 more.

Dan: [hesitates]

Dalia: The teacher gave him 3 **more** blocks [emphasizing "more"]. So what should you do?

Dan: Gives.

Dalia: What did she give?

Dan: Blocks.

Dalia: How many blocks?

Dan: 3. [takes 3 blocks and puts them on the floor near the other blocks]

Dalia: So how many blocks are there now?

Dan: 5.

Dalia: Wonderful! 2 blocks [pointing] and 3 more [pointing] equal 5 (Vid-4).

Dalia wrote in her journal that day that she "was very happy that the verbal support assisted Dan and that he did not need more intense support that included levels of imitation" (RJ-4).

No support. Dan solved mathematical problems without any support at four different time points during the intervention. Each of these points were markers of Dan's success. The first two times took place during the first stage, when completing addition and then subtraction respectively. Dalia stated happily, "Dan was able to solve the mathematical problem posed. He can solve addition and subtraction problems independently. I wonder if he will be able to solve them alternately" (RJ-7). The third time point at which Dan managed to solve the problems independently, with no support, was at the end of the second stage when he showed the ability to differentiate between addition and subtraction. During the part of the last session that involved EI, the children were preparing pancakes for breakfast at the kindergarten (Vid-15):

Dalia: Dan, you have 3 pancakes and you will get 2 more pancakes from Naomi. How many pancakes will you have? Show me.

Dan: [takes 3 pancakes and another 2 pancakes and immediately answers] 5.

Dalia: Wonderful. You added. Now, you have 5 pancakes and you give Gal 3. How many pancakes are left?

Dan: [gives Gal 3 pancakes and answers] 2.

The fourth time point was during the final diagnostic assessment. "I was so happy to see that Dan could understand and differentiate between the meaning of addition and subtraction. He participated in the last two sessions with no support, and I really think he's 'got it'" (RJ-16).

Discussion

The current case study aimed to develop and undertake an in-depth examination of a multifaceted CBE-based intervention involving three instructional methods (DI, EI, KI) and support for a 5-year-old boy with ASD. The purpose was to ascertain if the combination mentioned above of teaching methods and supports would be suitable for advancing his mathematical understanding. The findings were analyzed in two major steps which are discussed in the following sections.

Intervention, Construction, and Implementation

The increase in the number of students with ASD, according to the Centers for Disease Control and Prevention (CDC, 2018), alongside the lack of effective interventions, create a need to examine the nature and type of interventions used when teaching pupils with ASD (King et al., 2016; Long & Simpson, 2017). Furthermore, many teachers lack the appropriate knowledge concerning instruction for children with ASD. Hence it is essential to identify optimal practices

in mathematics, particularly in the early years, since early interventions are known for their long-range benefits (Green et al., 2018; Kim et al., 2018). This requires a more active role on the part of the teacher in determining which strategies to implement, when, and how. As such, understanding the teacher's decision-making process is crucial and in line with CBE principles (Lenski et al., 2019).

The first step of this case study tells how the intervention evolved and unfolded, focusing on the teacher's reflections, reasoning, and evidence-based decision-making. This individual story mirrors the principles of CBE, showing the continuous process and flow between assessment and instruction (Lenski et al., 2019). This included identifying educational goals, planning and implementing instructional procedures, evaluating their effectiveness and, most importantly, adjusting instruction based on relevant data. Throughout the intervention, Dalia shaped the standards-based kindergarten mathematics curriculum to accommodate Dan's preferences, needs, and abilities, making it highly personal and relevant. Dalia undertook an evolving intervention-design process in which she constantly adjusted the intervention's curriculum contents and structure in conjunction with the instructional methods and type of support. This depicted a unique learning process based on real-time data collection as reflected in her journal and the videos on the one hand and reading up-to-date literature and receiving guidance on the other. This is a practical and realistic process that can be widely applied to and by other teachers. Furthermore, it is a hands-on solution vis-à-vis worried proclamations regarding using "controversial and unsupported" treatments for children with ASD, supposedly resulting in wasted time, energy, and funds (Goldman & Gilmour, 2021).

Dan's Mathematical Development

In this step, Dan's mathematical development was examined in relation to the instructional methods (DI, EI, and KI) and the type of support given. Dan's unique needs demanded an approach that would engage him and facilitate his cooperation.

The instructional methods. The varying use of instructional approaches (DI, EI, and KI), allowing a variety of multisensory and kinesthetic learning experiences, enabled Dan to develop his mathematical understanding. This finding aligns with the concept that children benefit when teachers differentiate their instruction based on children's needs (Goldman & Gilmour, 2021). The use of a naturalistic setting, instead of a lab setting, afforded learning via concrete familiar objects, people, and activities. Following the findings of Su et al. (2010), direct and embedded methods are both recommended to advance the mathematical knowledge of children with ASD. Indeed, the student progressed in his problem-solving understanding, specifically in addition and subtraction, when taught separately. However, the combination of DI and EI did not suffice to advance his ability to differentiate between the meaning of addition and subtraction, which is the crux of understanding these numerical operations. A diagnostic assessment in the eighth session revealed his continued lack of differentiation and shifting between the two operations, leading Dalia to make a pivotal adjustment to the intervention by including an additional kinesthetic teaching method.

Of all executive functioning abilities, cognitive flexibility is especially affected in ASD, particularly related to response shifting and inhibition. The ability to switch between tasks is attributable to executive functions, an area of deficit for individuals with ASD (John et al.,

2018). This deficit appeared prominent for Dan when shifting from an addition response pattern to a subtraction response pattern; he had difficulty inhibiting his previously learned responses for addition when attempting to solve subtraction problems.

In general, addition or subtraction can be considered basic applications of counting forward or back, an ability that the student did possess prior to the intervention. Young children solve simple addition and subtraction story problems by counting concrete objects. They establish a one-to-one correspondence by moving, touching, or pointing to the objects they are counting (Jones & Tiller, 2017). The teacher used this technique during the first stage via DI and EI, thereby enabling the mastery of basic understanding for each mathematical operation separately, but no differentiation between the two. When KI was added, the concept that addition and subtraction are two aspects of the same thing, based on sequential counting, became clearer. As he jumped back and forth on the number line, the serial aspect became sharper, facilitating his complex information processing. These results suggest that the addition of KI can facilitate the understanding of concepts of numerical addition and subtraction operations and the difference between them. Furthermore, as shown in typical development, movement activities facilitate a broader and more holistic understanding of the mathematical subject taught (Smith et al., 2014). The movement generated by KI indeed advanced the more comprehensive mathematical understanding. Notwithstanding, future research should examine whether the effectiveness of KI to concretize the number series can be generalized to other children with ASD; whether KI is sufficient by itself or more effective as part of a multifaceted approach and, if the latter, at what stage should KI be introduced vis-à-vis DI and/or EI. If the former, KI may be the most effective, as it bypasses audio and visual inputs, which may be problematic in ASD.

The type of support. Support can be applied in various educational and social settings (Morcom, 2014). Learners with typical development usually experience instructional assistance that is gradually reduced, whereas children with ASD often need varying levels of support. The teacher's choices were in line with CBE teaching principles, in which the teacher does not provide just any type of help but help that is conditional to the level of expertise the child shows (Koole & Elbers, 2014). Accordingly, the teacher can facilitate children's learning in two ways: The first is the child's understanding of the task, and the second is related to the teacher's understanding of the child's performance characteristics (Koole & Elbers, 2014). Given that, the teacher constantly monitored the student's progress and adjusted the degree of support accordingly.

Acquiring and generalizing new skills can be particularly difficult in ASD, and generalization is often noted as a deficit (Sartini et al., 2018). The promotion of generalization is an essential aspect of teaching (Tzanakaki et al., 2015), as students could reduce their cognitive load if they were taught to generalize strategies (Sartini et al., 2018). This study incorporated the combination of naturalistic interventions occurring in the settings and activities the student typically experiences, alongside appropriate support, thereby ensuring natural reinforcement in response to correct skill performance (Wong et al., 2015).

Limitations and Future Directions

As in all research, there were limitations in this study. Although reflective journals are considered subjective, the analysis of the reflective journal by a mathematics expert together

with an ASD expert allowed for a reliable, in-depth examination of the teacher's experiences, opinions, thoughts, and feelings as part of the research design and interpretation process (Bashan & Holsblat, 2017). Another limitation is the use of a case study. However, according to a review regarding math intervention studies involving children and adolescents with ASD, the majority of the studies report one-on-one sessions (King et al., 2016). Nevertheless additional, more complex, study designs are necessary. Future studies should include group studies that use quantitative methods with a larger number of participants as well as control groups and should investigate the effect of an intensive, multifaceted intervention when implemented in small groups of pupils, as undertaken in special education teaching. An important area for future research would be implementing standardized evaluations of student progress, which was not done in this study. However, none of the foregoing detracts from the promising results of the present case study.

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***Lessons from the Trenches: Special Education Service Delivery and Instruction
Amidst the COVID-19 Health Crisis in California Schools***

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Abstract

In this qualitative study, 8 mild/moderate education specialists in California were interviewed to discuss what lessons were learned regarding online instruction and service delivery for students receiving special education services when schools closed due to the COVID-19 health crisis. Thematic analysis indicated that the following strategies were successful and would continue to be used or eventually implemented: Addressing affect before academics, frequent face to face interactions with students online, using familiar technology with flexibility, and creating consistency between home and school routines. Giving asynchronous assignments and non-consequential attendance and evaluation were considered ineffective practices posing major barriers impacting instruction and special education service delivery.

Keywords: Special education, education specialists, virtual instruction, online instruction, service delivery, COVID-19

***Lessons from the Trenches: Special Education Service Delivery and Instruction
Amidst the COVID-19 Health Crisis in California Schools***

Educators, students and families were taken by surprise when school doors immediately closed in the late winter/early spring of 2020 due to the COVID-19 health crisis. There was an insufficient amount of time to prepare for the abrupt transition from traditional instruction in brick-and-mortar settings to teaching and learning in a virtual environment at home. School districts rushed to outfit families with technology and hotspots (Camera, 2020). Teachers immediately asked for training on best practices for teaching online (Collins, 2020). Many parents and teachers looked to literature on effective online teaching strategies and homeschooling practices in order to make the best of at-home learning. Special education teachers took additional steps to carry out specialized academic instruction and host Individual Education Plan (I.E.P.) meetings virtually in order to remain in compliance with federal law. For better or for worse, the 2020 school year came to close with an unexpected new normal.

After a number of months passed, special education teachers, students, and families adjusted (somewhat) to an online learning environment. However, questions persist regarding how to proceed into the future should virtual instruction continue or be necessary once again. If instruction in this format should continue to take place in either an online or blended fashion in the fall of 2020 and beyond, questions regarding what should be done differently and what lessons have been learned must be addressed in order to improve learning outcomes for students. As a result, the intent of this study was to analyze COVID-19 virtual teaching practices and service delivery from the perspectives of 8 mild/moderate special education teachers in the field in order to determine what worked, what did not, and what should be done differently if circumstances remain the same and schools refrain from opening. The following research questions were posed in order to serve these purposes:

1. According to California K-12 education specialists what lessons were learned regarding online instruction of students receiving special education services during the COVID-19 health crisis?
2. If online instruction for students receiving special education services continues into the 2020-2021 school year (or should reoccur in future years), what should be done differently based on lessons learned from school closures stemming from COVID-19?

Results of this study can help inform special education service delivery and instruction in the future and provide strategies that could be implemented if another catastrophic event calls for school closures for an extended period of time. In addition, the study will contribute to a literature gap associated with effective special education service delivery and instructional practices via virtual platforms during times of crisis.

Review of Literature

The unique and unprecedented nature of COVID-19's impact on education exposes a vast knowledge and literature gap in a number of areas. It is important to examine the impact that crises have on education and instruction while taking note of significant differences between the most recent health crisis and previous pandemics. Now that living rooms and bedrooms have become the new classroom for so many students, components of effective homeschool learning environments will also be discussed. It is necessary to state that homeschooling and at-home instruction due to a health crisis are not the same. However, examining effective methods of homeschool instruction could offer some insight as to how teachers and families can approach at-home instruction in times of crisis. The general lack of information on effective homeschooling strategies for students and families of those receiving special education services makes this study all the timelier. While effective homeschooling strategies continue to be explored, this review will also highlight effective methods of providing education in virtual environments with hopes of better addressing the needs of those with exceptionalities who must be educated at home during times of school closures.

School Closures in the United States Due to Pandemics

Pandemics have plagued citizens of the world for centuries. According to Ott, Shaw, Danila, and Lynfield (2007) pandemics have occurred approximately every 40 years since the 1500s. Concerns regarding children spreading and being more susceptible to certain illnesses are supported by historical and medical data have resulted in school closures being considered one non-pharmaceutical intervention to stop the spread of a pandemic (Markel, Lipman, & Navarro, 2007). Fortunately, students in the United States of America have been rather lucky in that school closures due to a pandemic have been rare. One major exception occurred in 1918 when schools in various cities across America closed due to the 1918-1919 Influenza Pandemic (Carlo & Chung, 2009). The median duration of time that schools in 34 cities were closed was 4 weeks (Markel et al., 2007) though schools in some areas remained closed for as long as four months, according to Paul Reville, at the Harvard Graduate School of Education (as cited in Mineo, 2020). Almost 40 years later, the H2N2 virus in 1957 and then the H3N2 virus in 1968 also

caused some schools' doors to close due to excessive absences (Carlo & Chung, 2009). 2009 brought about the next wave of school closures when H1N1 spread across the world. 726 K-12 schools closed in 2009 on an *ad hoc* basis for periods ranging from 1-2 weeks following changes in CDC recommendations (Klaiman, Kraemer, & Stoto, 2011).

While school closures were no doubt significant during these times, the extent and duration of these closures paled in comparison to COVID-19 school closures. With the closest rival being the extensive closures taking place during the 1918 pandemic, these closures were not as widespread as those we have experienced recently (Mineo, 2020). Sadly, the end has yet to come. At the time this article was being written, California schools, as well as schools in many other states had been closed for approximately 12 weeks with no specific dates to reopen under normal operating conditions. While COVID-19 did not result in the first time U.S. schools were closed, it is clear that the extent of school closures for the extended period of time for which they have been closed was unprecedented.

At Home Instruction for Students During a Pandemic

Examining one's past can inform the future, but in the case of the current health crisis history has not been of much help. When schools closed due to a pandemic in the past, how were the educational needs of students addressed? Interestingly, the 1918 flu pandemic resulted in very little (if any) take home assignments. According to curator at the Smithsonian National Museum of American History, Debbie Schaefer-Jacobs (as cited in Rich, 2020) students may have been given reading assignments but additional homework assignments would have been minimal. At this period in time, students were more likely to engage in household chores, jobs delivering newspapers, or working on farms (Rich, 2020).

By the time the next pandemic affected American schools, academic standards had changed significantly. Though research and literature on how at-home education was handled during the virus breakouts in the 1950's and late 60's is limited, it is likely that more homework assignments were given during these times. Events such as the Great Depression and especially the Cold War made academics a greater priority in the U.S. (Roos, 2019). In the early 60's students reported doing 2-3 hours a week but by the late 60's social movements that focused on questioning authority resulted in many homework assignments going undone (Roos, 2019). However, whether the educational needs of those with exceptionalities were addressed in the same fashion is doubtful. Prior to the passage of the Individuals with Disabilities Act (PL 94-142) in 1975, service provision for those with disabilities was poor and those with exceptionalities were often completely excluded from their typically developing peers, according to the U.S. Department of Education (2010). To demonstrate this, only 1 in 5 children with disabilities were being educated in U.S. schools with their general education peers in 1970 (U.S. Department of Education, 2010). With this in mind, it is difficult to determine exactly how at-home education for exceptional students was handled during normal circumstances, muchless what attention these students were given when schools closed due to viral outbreaks in 1957 and 1968.

As time went by, technology became more advanced. This resulted in instructional options which went beyond pencil and paper packets. However, even when this technology was available it was not exactly accessible when necessary. Distance education strategies have been

encouraged since 2006 but many of the tools and resources available today were not options when schools closed again in 2009 due to H1N1 (Bailey, 2020). At this time the U.S. Education Department recommended that schools and districts provide remote learning options for ill students such as posting assignments online or giving take home assignments (“Swine flu,” 2010) but assignment recommendations for healthy students were unclear. Because school closures did not persist as they have with COVID-19, the necessity to explore education options for extended at-home instruction was integral as it is today. In summary, the unique nature of this health crisis has not offered today’s educators an opportunity to benefit from historical ‘lessons learned’ or approaches to education or service delivery when schools must close to prevent the spread of a pandemic.

Strategies for Facilitating Successful Academic Instruction in the Home

When schools must close, the home becomes the new classroom. It is important to emphasize that at-home instruction due to school closures during a time of crisis is very different from and should not be synonymous with traditional homeschooling. Those who homeschool their children have chosen to do so for specific reasons. Research on homeschooling in general is lacking, especially with regard to effective teaching strategies (Anthony & Burroughs, 2012; Thomas, 2016; Ray, 2000). Literature that is available on the subject tends to focus on reasons *why* parents homeschool. A recurrent theme in homeschool research is that parents choose to home school their children for reasons associated with pedagogy and/or ideology (Van Galen, 1991 as cited in Taylor-Hough, 2010). One’s religion or academic and methodological beliefs tend to motivate parents to homeschool (Taylor-Hough, 2010). As a result, a conscious choice is made by the family to provide education within the home environment for very specific reasons about which many families are very passionate.

A situation where parents have chosen to homeschool is very different from incidences where parents have no choice but to provide education at home because there is no alternative. But while the choice component is lacking, it is still important to consider what works when at home-instruction takes place. It may be possible to replicate some of these practices if and when on-campus schooling is not an option for families. When schools close due to a pandemic, time to prepare, resources to deliver instruction and parental support may be lacking. Many educators and families may not know what to do or where to start. As a result, it is necessary for educators and families to take what research there is on effective homeschooling strategies and routines into account, in spite of research on homeschooling being limited (Thomas, 2016). This can facilitate successful instruction in the home just in case schools must again close due to health or other reasons.

Routines

When faced with providing instruction at home, questions about how to establish a routine for schooling are inevitable. Traditional schooling is filled with routines that students have grown accustomed to. Consistent daily schedules with specified start and stop times for academics, activities, breaks and recesses are very common. But what about the routines of those who homeschool their children? Are there takeaways that can be used by schools and families when on-campus instruction is not an option? According to Luke (2003), the innovation and creativity associated with successful homeschool instruction could offer valuable information to different sectors of the education community (as cited in Thomas, 2016). The routines of families that

homeschool their children are among some of the unique aspects of this instructional model. While some parents have very structured routines similar to those at public or private schools, homeschooling research suggests that routines vary widely (Thomas, 2016). This was consistent with Sabol's (2018) findings with regard to the flexible structure of homeschooling. This flexibility allowed parents to develop routines that met the unique needs of the individual and the family (Sabol, 2018). These findings are very encouraging for schools and families, since students and families are so unique and may not be able to replicate a daily schedule similar to that their child experiences in school daily for a variety of reasons. Therefore, a strict routine that conforms to school standards for instruction may not be necessary for academic success when and if at-home instruction must take place. For example, Thomas (2016) found that the academic day for homeschooled students consisted of an average of 4 (or fewer) instructional hours. Both Thomas (2016) and Sabol (2018) found that homeschooling families devoted additional time to community activities such as field trips, volunteer work and other real-life learning opportunities. It was clear that community resources and offerings could influence the daily homeschool routine (Thomas, 2016). Even in cases where families had more structured and traditional routines, participant families in Anthony and Burroughs' (2012) study still enjoyed the educational autonomy allowed for enrollment in courses being taught by someone in the community or even online. While community activities could in fact be limited during a pandemic, alternative project-based learning assignments or virtual camps may be options over students sitting in front of a computer for virtual instruction for hours on end.

Collaboration with Outside Personnel, Agencies or Entities

While there are some stark contrasts between public/private school and homeschool routines, a commonality between traditional and homeschooling families is the desire to collaborate with outside agencies or entities to add to one's educational experience. Parents who homeschool their children are not working alone. It is estimated that over 70% of families who have chosen to educate their children at home are working with a homeschool organization (Litcher & Schmidt, 1991 as cited in Hanna, 2012). Many parents look for guidance on how to provide instruction at home and therefore seek guidance on how to proceed. Ray (2000) suggested joining a support group and subscribing to publications for homeschooling parents. This was precisely what families did in Anthony and Bourroughs' (2012) and Sabol's (2018) studies. Here families either worked with a homeschool organization (Anthony & Bourroughs, 2012; Sabol, 2018) or networked with other homeschooling families (Sabol, 2018). This collaboration and networking indicate that homeschooling families are not working in isolation but rather working with outside agencies to improve their children's' education.

The collaboration that takes place between the homeschooling family and other entities contains parallels to what often occurs between the families of those receiving special education services and service providers outside of the school, but for reasons or goals that may be slightly different. The collaboration between families and outside agencies often centers around transition or implementation of evidence-based interventions to support a child receiving special education services. As a result, parents or guardians of individuals with exceptionalities may begin working with outside agencies long before the child is even old enough to enter any type of school. For example, families of individuals with Autism Spectrum Disorders frequently begin receiving specialized services when the child is 3 or younger (Friend, 2014 as cited in Garbacz, McIntyre, & Santiago, (2016)). Parents of those receiving special education services find

themselves coordinating services *and* implementing interventions for their children (Carbone, Behl, Azor, and Murphy, 2010; Knoche Edwards, Sheridan, Kupzyk, Marvin, Cline, & Clarke, 2012 as cited in Garbacz, McIntyre, & Santiago, (2016)) making collaboration all the more important. When children have special needs, families are used to collaborating with outside agencies and entities in order to reap the benefits of early intervention.

In addition to collaboration for the purposes of intervention, families of those with an exceptionality often look to sources outside of the school for support that will help them prepare their children to live and work independently in the future. For about 40 years now, those attending public schools and receiving special education services have benefitted from transition planning. The Individuals with Disabilities Act amendments in the 80's and 90's contained key components which emphasized the importance of transition and transition services for students receiving special education services (Kohler & Field, 2003). Educators and families are well aware of the fact that preparing students for transition out of school requires successful collaboration between many parties. According to Osher (2002), "Collaboration involves efforts to unite organizations and people for the purpose of achieving common goals that could not be accomplished by any single individual or organization acting alone" (p. 92). Individuals with exceptionalities and their families must work successfully with more and more people outside of the school and in the community in order to help foster independent living and occupational skills. In recent years there has been an increase in transition programs attempting to provide students with an opportunity to benefit from real life experiences within the community (Kamens, Dolyniuk, & Dinardo, 2016). This being said, it is very possible that students receiving special education services may be working with community members and organizations as part of their transition plans.

Autonomy, personalization and flexibility of one's schedule appear to be significant benefits to students who are receiving instruction at home. Homeschooling families also utilize community resources and collaborate with others in order to create more learning opportunities for their children. While some significant differences may be observed between the routines and instructional approaches between school and home-based education, similarities do exist (especially for families of children with exceptionalities) with regard to collaboration with outside agencies and entities to create a more comprehensive education for the child. Such findings may be utilized successfully by special needs families when and if at home instruction is the only option due to school closures.

Online Instruction and Students with Exceptionalities

Until it is deemed safe for students to physically return to school, online instruction will continue. According to Lieberman (2020), "Few schools in the United States will get through the 2020-21 academic year without some form of remote learning, for some portion of the student body, for some period of time (n.p.)" In addition, the CDC checklists for both teachers and parents encourage dialogues with the school regarding online instruction (CDC National Center for Immunization and Respiratory Diseases (NCIRD), Division of Viral Diseases, 2020). As a result, it is necessary that schools look to effective strategies for teaching students with diverse learning needs online.

Similar to research on the effectiveness of homeschooling, additional literature on effective strategies for teaching students receiving special education services online is needed. According to Cavanaugh, Barbour and Clark (2009), very little empirical evidence that references the learning outcomes of those with exceptionalities attending online schools is available. In spite of the fact that more and more families of students receiving special education services have chosen virtual schooling since the 1990s for many of the same reasons that parents have chosen to homeschool their children, very little attention has been devoted to students with exceptional needs attending online schools (Carnahan & Fulton, 2013). However, for those teachers who instruct students receiving special education services online, it is perceived that individualized instruction, flexible schedules, extended time to complete assignments, and supplementary learning resources are potential advantages of virtual schooling (Martenev & Bernadowski, 2016). For example, families can choose from either synchronous or asynchronous instruction to teach and reinforce concepts during times that met their child's needs and schedules (Murphy, Rodriguez-Manzanares, & Barbour, 2011). Deadlines can be flexible for self-paced assignments (Rauh, 2011). Students may have virtual access to mentors, teachers, and support staff when needed for small group instruction and/or extra support (Repetto, Cavanaugh, Wayer, & Feng, (2010) as cited in Martenev & Bernadowski, 2016). In summary, curricular modifications and accommodations tailored to the specific needs of the student and his/her areas of strength and need should be considered when teaching entirely online (Keeler & Horney, 2007 as cited in Carnahan & Fulton, 2013) similar to the way in which they should be considered with on-ground instruction. Although students receiving special education services attending public schools possess an individual education plan, this information suggests that if (and when) schools must close, an individualized, online learning plan for these students may not only be beneficial but necessary.

Method

Phenomenology was used to collect and analyze data in this study. This particular paradigm was chosen in order to capture the experience of special education teachers who had to abruptly shift from teaching in brick-and-mortar settings to virtual instruction and service provision due to COVID-19. The intent was to answer the following research questions based on data collected during telephone interviews in spring and summer of 2020. The following research questions were posed to guide the research process:

1. What lessons were learned according to California K-12 education specialists regarding online instruction of students receiving special education services during the COVID-19 health crisis?
2. If online instruction for students receiving special education services continues into the 2020-2021 school year (or in future years), what should be done differently based on lessons learned from school closures due to COVID-19?

Sampling Method and Participants

Convenience sampling was used to recruit participant special education teachers with mild-moderate teaching credentials in California. Potential participants were invited via email to participate in a phone interview to share their perspectives based on personal experience of what

worked for them and their students, what did not, and what should be done differently should COVID circumstances prevent the physical return to schools.

Study participants consisted of 8 special education mild-moderate teachers. Participants had between 1-20+ years of experience. 5 participants taught in central California school districts, 2 were located in northern California districts, and 1 was teaching in a southern California school district.

Procedure

The P.I. emailed potential participants with information about the intent and requirements of the study to determine if they were interested in participating. Upon expression of interest to participate in the study, acquisition of written consent to participate in the interview was acquired electronically. Individual, private, phone interviews were scheduled and conducted during times that were convenient for each teacher. During the interview, participants were asked three questions in order to address research questions posed for the study.

1. Since schools have closed, what teaching and instructional service delivery methods have worked for you and your students?
2. What has not worked?
3. If schools remain closed due to COVID-19 in the 2020-2021 school year, what (if anything) would you do differently?

An empirical phenomenological approach was used to collect and analyze qualitative data in this study. This approach requires a return to experience in order to obtain comprehensive descriptions which capture the essence of those experiences (Moustakas, 1994). Ultimately, the goal is to establish what an experience means for an individual based on the comprehensive description that individual has provided about that experience (Moustakas, 1994). Analysis of these descriptions requires identifying significant statements and clustering them into themes that capture the essence of experiences by participants (Moustakas, 1994 as cited in Cresswell, 2007). Participant responses to questions posed in this study were recorded by hand by the primary investigator. Narrative analysis, word and phrase repetitions were used to code responses and then identify common themes which emerged from questioning.

Trustworthiness and Credibility

The primary investigator was a current assistant professor of special education at a private university and former mild/moderate education specialist in the K-12 setting in California, who was well versed in the teaching of students with mild-moderate disabilities and the provision of services associated with individual education plans for these students. As a former colleague or instructor of participants, those who chose to participate in the interview were very open and honest when answering questions. The relationship between the P.I. and the participant did not impact answers to questions since questions were geared toward work experiences with which the primary researcher was not associated. The close relationship between the researcher and participants resulted in a greater amount of honesty due to the higher level of comfort associated with the interviewer, thus increasing internal validity. In addition, all participant identification information, places of employment, and exact positions were changed in order for participants to remain anonymous.

Upon completion of the study, a draft of preliminary results and conclusions was sent via email to all participants. Participants were invited to set up a phone conference to discuss the accuracy of these findings. Recommendations for edits were made to the principal investigator at that time. 6 of the 8 participants chose to review and participate in a follow up phone interview to discuss the accuracy as well as the extent to which they agreed with the results and conclusions of the study.

Results

A descriptive approach to data analysis is a method of analyzing data within empirical phenomenology. Giorgi (1985) explained that data are comprised of naïve descriptions obtained through open-ended questions and dialogue with participants in the study. Since determining what an experience means to an individual is central to this approach (Moustakas, 1994), participant descriptions of what it was like providing services during the pandemic, what worked, what did not, and what should be done differently were necessary to capture the essence of these experiences. Using the modified approach to analysis proposed by Moustakas, (1994) all relevant statements in response to open-ended interview questions were recorded, clustered and synthesized into themes. Verbatim examples were then used to support these themes (Moustakas, 1994).

A total of 6 themes emerged from interview data and are highlighted in Figure 1 in order to address the first research question, *what lessons were learned according to California K-12 education specialists regarding online instruction of students receiving special education services during the COVID-19 health crisis?* Four of these themes centered around lessons learned regarding experiences, practices, strategies and programs that were successful in providing instruction to students with exceptionalities online during the pandemic. Two themes emerged from what practices were not as effective during this time. A total of four themes emerged based on participant responses to questions related to research question #2, *if online instruction for students receiving special education services continues into the 2020-2021 school year (or should reoccur in future years), what should be done differently based on lessons learned from school closures stemming from COVID-19?*

These themes were directly related to what participants would continue to do or what would be done differently should virtual instruction continue based on personal experience.

What Worked

Four major themes emerged with regard to strategies, programs, and practices which have been effective while teaching students with exceptionalities during COVID-19. These consisted of addressing affect before academics, having frequent face to face interactions with students online, using familiar technology with flexibility that both teachers and students can access, and creating consistency between home and school routines.

Theme 1: Address Affect before Academics

Teachers shared that they perceived that the immediate closure of schools, the quick transition to online learning, and the social isolation of quarantine took a major toll on their students both mentally and emotionally. This necessitated the need to address mental and emotional health

first and then academics second. One participant who worked with students with emotional and behavior disorders stated, “A global pandemic is a trigger for my students. It is traumatic.” Another teacher stated that when she posted emotional check-ins to which students were asked to respond online, many of them marked “frustrated” or “need help”. As a result, addressing the social emotional needs of students as the first priority was a strategy that many of those who participated in the study found to be successful. Participants shared that using social emotional activities and online positive behavior reinforcement systems each day were successful strategies. For example, one middle school teacher shared that she posted prompts using Zones of Regulation[®] on her Google Classroom[®] site in addition to posting fun, engaging prompts that got students’ attention. She said, “I will post something silly for them to comment on and it’s due on Friday. We (staff and students) will all comment on each other’s posts. It has worked really well!” In addition, daily emotional check-ins were conducted by both her and mental health service providers via the internet and phone if the student did not want to respond online. Another teacher began to use a social emotional activity called, “Today I feel” with her students due to the amount of anxiety they were experiencing. Participants also appealed to student emotions by using gameology or programs such as Class Craft[®], Kahoot[®], and PBIS Rewards[®] to get students excited about attending class online, behaving appropriately on camera, and completing given tasks. It was shared that these also encouraged students to remain engaged during synchronous sessions, since they were earning points as an individual, team or both. These teachers saw a shift in student mood once points and online rewards were being earned.

Theme 2: Frequent Face to Face Interaction Online is Vital

The overwhelming number of participants shared that when they were able to meet with students one-on-one or in a small group even for a short period of time online, much more was accomplished in the way of academic tasks. Most participants in the study used either Zoom[®] or Google Meet[®] in order to meet with students. How often teachers met with students varied from once per week, to three times a week, to everyday. For example, one teacher at the high school level set up individual meetings with students every Monday to go over assignments that were being given for the week. Others met with students daily. For example, an elementary special education teacher found that the best way to deliver services was to meet with her students 4 times per week for 30-40 minutes. Some participants were fortunate enough to have paraprofessionals meeting with their students also. These meetings took place daily for 30-60 minutes. Interestingly, almost every teacher interviewed stated that the more often they had meetings with students, the better. This tended to be the teachers’ perception because academics were difficult for many of their students, especially those who had a learning disability. A number of participants stated that even if a student was motivated to complete an assignment, many were unable to complete it without assistance. One middle school teacher stated, “It was hard for them to do the work in class in front of me, muchless on their own at home.” One-on-one and small group instruction allowed students to get help with assignments given by either the education specialist or the general education teacher. In addition, the virtual meetings allowed teachers to keep students focused on a task. As one participant commented, “It is the only way to replicate looking over one’s shoulder in class.” This comment was reinforced by another who said, “It (one-on-one meetings) is the only way that work gets done.”

Theme 3: Use Familiar “Shared” technology with Flexibility

Another theme which emerged from interview data was the importance of having a shared place online where students and teachers could access the same information and material. Almost every participant mentioned using Google Classroom[®] to either issue assignments, access assignments being given by general education teachers, and track academic progress. Seven of the eight participants were using Google Classroom[®] to assign tasks and/or track assignments given by other teachers of students on their caseload. The remaining participant at (who taught at the high school level) stated that she would like access to general education teachers’ Google Classroom[®] so that she would know what her students were supposed to be working on each week.

It is important to mention that Google Classroom[®] was something that students were familiar with prior to COVID-19. The students’ familiarity with Google Classroom[®] before school closures was a possible reason for its successful use at home. One participant was using Google Classroom[®] so successfully at the elementary level that she was able to collaborate with an occupational therapist and adapted physical education teacher to provide additional at-home resources to students receiving those services.

Though Google Classroom[®] was familiar to students already, some participants noted that changes still had to be made to what students were being asked to do. This mainly had to do with the reduced levels of support students had when navigating classroom sites from home. For example, teachers at both primary and secondary levels needed to simplify their Google Classroom[®] sites so they did not overwhelm students working independently. Others discussed the need to post assignments with recorded tutorials first thing on Monday so that students had the time and support needed to work on them throughout the week.

Remaining flexible with due dates was also an adjustment that needed to be made. One teacher described how shocked she was to see the times at which K-5 students were submitting assignments to Google Classroom[®]. She said, “Some kids are submitting work really late, like 2 or 3 a.m. because their parents are essential workers and that was the only time, they could help them.” One teacher summed up what others also stated in different words by saying that the biggest takeaway from what has occurred due to the pandemic was the, “need to remain flexible.”

Theme 4: Consistency between School and Home is Necessary

School closures were abrupt and the lack of preparation for at-home learning was an issue. As a result, many teachers in the study tried to maintain as much consistency between what was being done at school before schools closed and what was to be done at home as much as possible. One participant said, “I tried to set up my online classroom the same way that I set up my actual classroom.” At least half of the teachers in the study were also attempting to use the same academic programs online that they had been using at school. Participants reported that prior to school closures, they were using programs such as Read Naturally[®], BARTON[®] reading, Read 180[®], Khan Academy[®], Study Sync[®], and Wonder[®]. Since these programs already had online components that students were used to using, the transition was not as challenging.

In addition to using the same programs at home that were being used at school, teachers reinforced the importance of continuing to use technology and assistive technology with which students were familiar to facilitate and supplement instruction. Four participants stated that their districts provided hot spots, tablets, and/or computers for students to take home in order to attend school and better access curricula. Assistive technology commonly used with students on campus continued to be used virtually as well. Using familiar programs and tools added a certain amount of consistency to academic routines following the transition to online learning.

What Did Not Work

Interestingly, only two major themes emerged from interview data concerning what was not successful for special education teachers and their students during COVID-19. It was clear that the majority of teachers interviewed possessed the same perceptions with regard to what was posing barriers to successful instruction and service delivery during this period. These included asynchronous assignments (or activities) and non-consequential attendance and evaluation.

Theme 1: Asynchronous Assignments and Activities

Unless students were online and working with a teacher or paraprofessional synchronously, numerous participants shared that schoolwork was not being completed. As a result, many teachers stopped assigning as much independent work as they had under ‘normal’ conditions. According to one teacher, “I have stopped posting assignments every day. It was too much.” Similarly, another teacher stated, “I cut way down on the assignments given and provided major modifications and accommodations with long extensions. The work still did not get done. Now I give them one assignment each day and have them work on it at their own pace.” All but one participant shared that the majority of tasks that were being assigned to students to complete independently at home were not getting done. A high school teacher claimed that, “The ones who are logging on are getting work done but they are the ones with A’s. The ones who are not getting work done are the ones I need to see.”

A major concern for participants for reasons in addition to independent work not being completed was the number of students who were home alone. Parents were either working or unable to help them log on, work on assignments, supervise them, etc. Even if parents could be present during school hours, many were unable to assist their children for a variety of reasons. Teachers felt that language barriers, technology challenges, and lacking the knowledge needed to complete academic tasks tended to be suspected reasons for a lack of parent support. Overall, those interviewed perceived the lack of support at home to be the primary reason why asynchronous activities were not being completed. As one participant stated, “Parents need to be there standing over their students. It helps with the urgency to do work.”

Theme 2: Non-Consequential Attendance and Evaluation

The majority of participants (six out of eight) stated that it was very difficult to get students to log on for class meetings or to access assignments. Only two teachers stated that this was not a concern. A number of teachers felt that not being *required* to log on and knowing that there were no consequences for absences were primary reasons why students were not attending class or accessing their work which was posted in Google Classroom®. As one teacher stated with regard to attendance not being mandatory, “So many kids are not coming, and these are the kids that really struggle. There is no accountability right now. Grades can only go up, not down.” A

high school teacher said, “I have students who are sleeping in until noon. There is no accountability and students are taking advantage of this. I spend a lot of time calling home, but parents do not answer. Since I cannot use my classroom phone anymore, I have to use my personal cell. I have to block my number when I call but parents will not answer calls from a private caller.” In summary, participants felt that lacking a mandatory requirement to attend class was a major barrier to instruction and service delivery with students home alone and no consequence for absences.

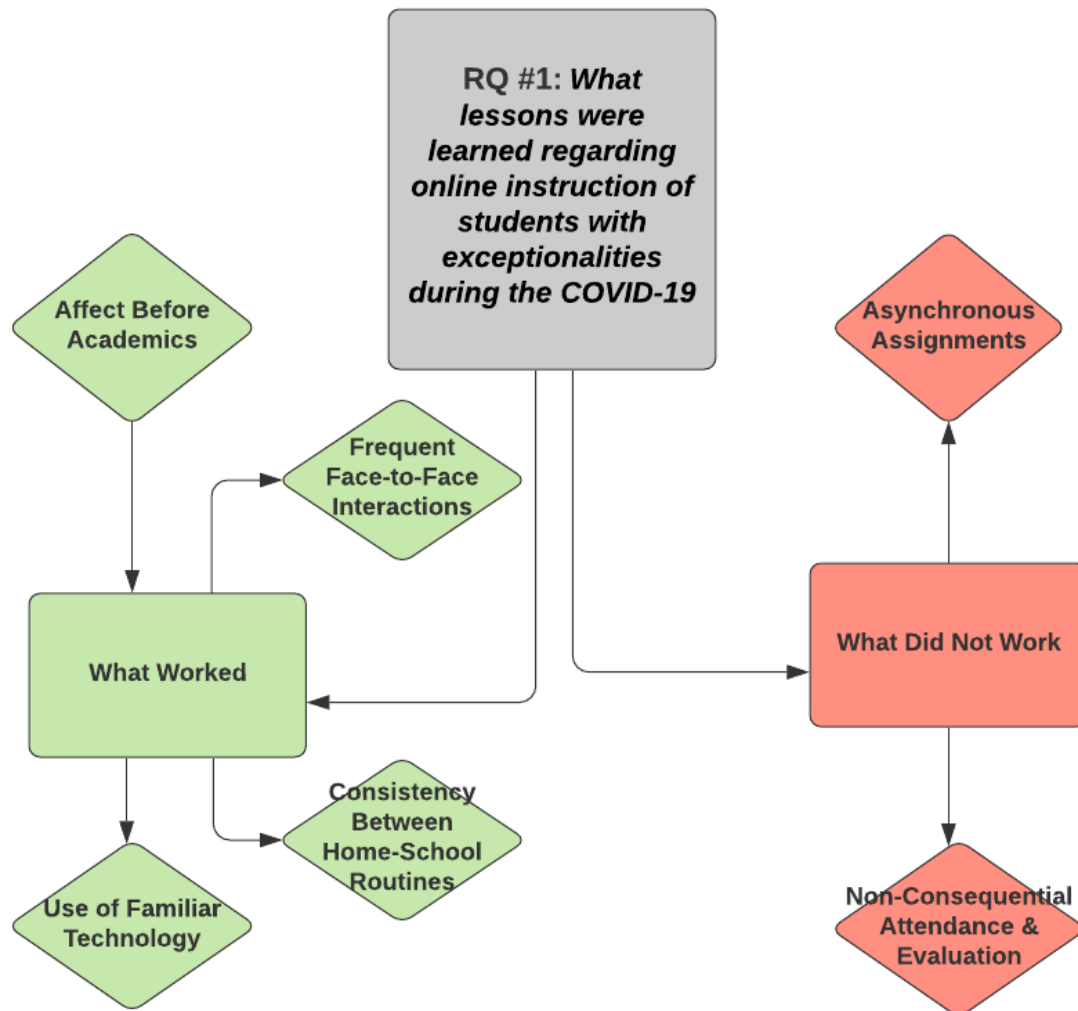


Figure 1: Lessons Learned Regarding Online Instruction of Students receiving special education services During COVID-19

Research Question #2: *If online instruction for students receiving special education services continues into the 2020-2021 school year (or in future years), what should be done differently based on lessons learned from school closures stemming from COVID-19?*

The lessons learned from effective or ineffective practices, programs and strategies tended to guide participants' answers to the second research question. At the time of the interviews, only two participants knew how their school districts planned on proceeding with instruction in the fall of 2020. However, based on information and conditions at that time, almost all participants assumed that there would at least be some continued instruction at home and online. With this in mind, participants discussed what they would continue to do and what should be done differently assuming that they would need to continue with virtual instruction. From these conversations, the following four themes emerged: 1. Rapport and routines will need to be established with new students and families, 2. Synchronous meetings with students must take place as often as possible, 3. Higher levels of accountability to attend class and complete assignments are necessary, 4. Special education teachers need to remain flexible, empathetic, and compassionate. These themes are highlighted in Figure 2.

Theme #1: Rapport and Routines will be Need to be Established with New Students and Families

When school went from being on campus to online at home in the spring of 2020, teachers had already spent over half of the year working with students and their families. The home-school connection had been made. Study participants stated that having spent half the year with these students made certain aspects of online instruction and service delivery easier. However, a new school year would bring new students and new families. A number of teachers expressed concerns about how they would establish a rapport with students and families they would be unable to meet in person. In the words of one participant, "We know the students now and have a relationship with them, but next year with a new group that rapport will not be there yet." Similarly, another teacher stated, "We have to maintain communication and develop rapport with families." This communication will be necessary to not only communicate progress to parents but also set up I.E.P. meetings, discuss classroom procedures, and offer assistance to parents as they help facilitate at-home instruction. For example, two participants shared that they will be spending the first weeks of school training elementary students and parents on how to use technology such as Zoom and Google Classroom® for these purposes.

Theme #2: Synchronous, online meetings with students must take place as often as possible

Synchronous meetings with students were mentioned by participants as being very important while schools were closed for two reasons. Teachers felt that they were better able to teach content and help students with assignments in other classes when they could meet with their students online. The second reason was to ensure that work was getting done. Because so many students were not completing work independently, every participant shared that next year's instruction *must* consist of synchronous, virtual meetings with students as often as possible. Interestingly, teachers cited the importance of involving paraprofessionals (or Instructional Assistants (I.A.s)) in these sessions as well. According to one teacher at the secondary level, "We must have those synchronous sessions. Ideally it would be great to have I.A.'s meet with them too." The same sentiment was echoed at the elementary level by another teacher. With a laugh, this participant stated, "It would be great to have the aides signing in too. They get sick of just seeing me." Meeting with students online allowed teachers to observe assignments being completed. They also provided more meaningful, specialized academic instruction and support opportunities.

Theme #3: Higher levels of Accountability are Needed

Participants perceived that not having mandatory attendance policies in place along with non-punitive grading were major barriers to instruction and service delivery. The word “accountability” was used specifically by three participants but alluded to by 4 other participants in their interviews. Comments centered on how school districts in the fall of 2020 should hold students and families accountable for attending class, accessing assignments and completing those assignments. As per one teacher, “We need to find a way to get students to log on and work with the school to hold students accountable.” Similarly, another claimed, “We need to make it required to do the work. This needs to come from the district.”

When students were missing in action, teachers had to take on more of an administrative role and this was difficult for teachers. In addition to designing lessons, teaching, and assisting students, two teachers expressed frustration with the inordinate amount of time spent calling home because students were not attending class and/or submitting assignments. Others described the tediousness associated with calling home and having to document attempts to reach out to families. Participants felt that having additional policies in place may have alleviated some of the stress and extra work associated with having to follow up with families of students not showing up for class and/or doing their work.

Ensuring that all parties were doing their part to get students to attend class and do their work was a major issue. One teacher’s district planned to address at-home learning and accountability by creating online learning plans in addition to the I.E.P. in the fall of 2020. She said, “The plan is to enter goals into a student’s distance learning plan in addition to the I.E.P. We will still be holding the IEP but be creating a distance learning plan as well.” This plan would be created collaboratively with the family and agreed to be upheld by all I.E.P. team members. It would also be tailored to the individual and his/her family. A virtual learning plan (in addition to the I.E.P.) could help teachers who are struggling with setting up meetings with students and families. As per a secondary teacher, “I have tried to schedule individual meetings with students, but they do not come. It has also been hard setting up I.E.P. meetings online. Getting parents to respond has been difficult.” Frustrations associated with poor attendance and assignment completion resulted in most participants desiring mandatory requirements with higher levels of accountability to address these issues.

Theme #4: Special education teachers need to remain flexible, empathetic, and compassionate

Though increased levels of accountability were cited by participants as being necessary, teachers were very open about the need to remain flexible and empathetic to successfully emerge from this crisis. Prior to the pandemic, academics were typically top priority, but the pandemic seemed to change this. New students coupled with pandemic stressors reinforced the need for participants to either begin using or continue to use social emotional learning lessons and behavior reinforcement programs to encourage and maintain positive affect in the virtual classroom. As shared previously, many participants were already using programs such as Zones of Regulation[®], Second Step[®], Class Craft[®] or PBIS Rewards[®] to create positive emotions, increase engagement, and reinforce good behavior online. There was also discussion of creating fun or flexible Fridays online for both primary and secondary students where social-emotional and mental health are a focus over academic tasks. Responses indicated that before academics could be addressed, mental, social, and emotional health of learners needed to be considered.

Students however were not the only ones attempting to manage difficult emotions associated with the pandemic. Participants shared that with virtual learning, they were able to see more deeply into the home lives of their students and this was not always a good thing. According to one high school teacher, “Coming to school was a safe place for them.” Similarly, another high school teacher shared that there have been incidents with some of her students that she did not think would have occurred if they had been physically at school during that time. Teachers also stated that they had witnessed events on camera that were very eye-opening and sometimes uncomfortable. One participant stated, “I have seen my students babysitting or helping their younger siblings.” Others claimed that their students were often home alone without any supervision. According to an elementary autism support teacher, “We are seeing into our kids’ lives and at times it can be uncomfortable. Teachers need to have more sensitivity and empathy. It is really hard. It helps us understand more of what our kids are coming from.” A number of participants stated that these experiences created a higher level of empathy toward their students. As a result, teachers created choices for assignments, a variety of participation options, and offered flexible due dates as accommodations.

Fear stemming from the pandemic, difficult home lives, and the need to establish a rapport with new students and families were some additional reasons that those participating in the study stated that they would be using social emotional learning (SEL) activities or programs in the fall. Increased teacher empathy and compassion appeared to spark an even greater desire to continue using programs that supported the social, emotional, and mental well-being of students.

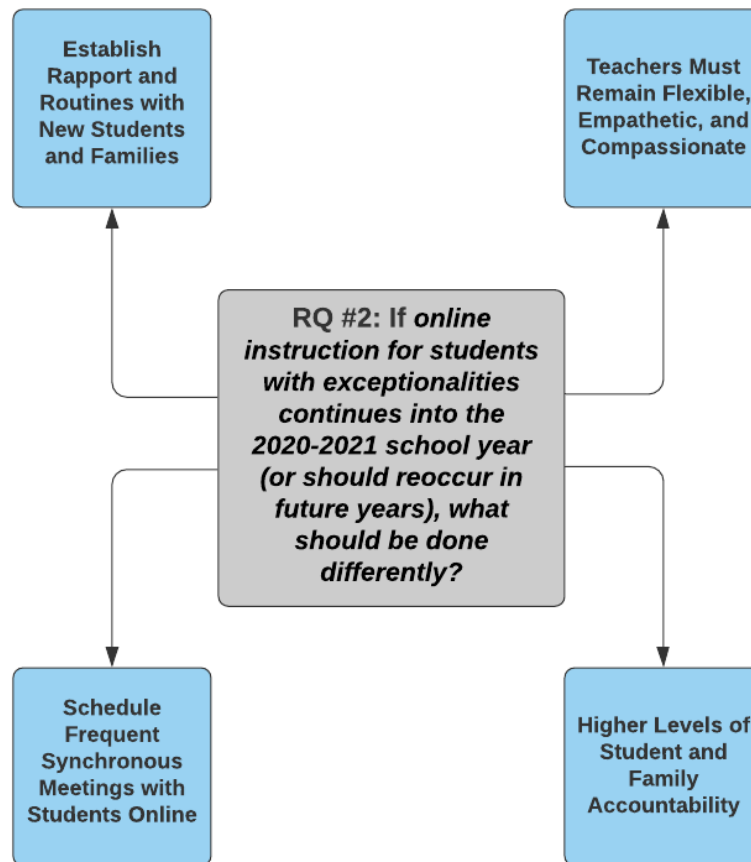


Figure 2: What Should be Done Differently Should Online Instruction of Students receiving special education services Continue?

Discussion

Lessons Learned and Moving Forward

Lessons learned from COVID-19 instruction focused on what strategies and practices have been successful while teaching and delivering services to students with an I.E.P. online as well as those strategies and practices that have not been as successful. The eight mild-moderate special education teachers in California who participated in this interview claimed that addressing affect before academics, frequent face-to-face interactions with students online, using shared technology that was already familiar to students, and creating consistency between home and school instruction were effective practices after school closures occurred. The lessons learned in the spring would drive decisions for fall and beyond. While some procedures or protocol may have been out of teacher control (such as mandatory attendance and consequential grading), participants planned to make adjustments to virtual instruction based on what worked or did not work well for them and their students in the spring.

The pandemic created fear and anxiety for many students and families. Abrupt transitions resulted in many students home alone while parents who were essential workers worked long, odd hours. Others appeared to be stuck in unstable home environments from which school used to serve as a refuge. Most of the teachers in this study saw an immediate need to create a safe place online where mental and emotional check-ins could take place and emotions could be safely expressed. That being said, ensuring that students' mental and emotional needs were being met was the first priority and this was a success. Once these were addressed, more academic instruction could take place. It was no surprise that continued and even heightened efforts to address the social-emotional needs of students was cited as something teachers planned to do when school started again in the fall of 2020.

Many of the students on the caseloads of participants at the time of the study struggled academically and have for many years. Getting them to complete assignments on their own even prior to school closures was a challenge. However, when teachers were able to meet with students online, work got done. Frequent face-to-face, virtual interactions allowed teachers to provide specialized academic instruction, and offer assistance with accessing general education curricula. Asynchronous instruction with independent assignments were described as being futile by most participants. Motivation, ability, resources, and a lack of support all were perceived as reasons why students did not complete work independently. These coupled with optional attendance and non-punitive grading were additional reasons why teachers felt that many assignments were incomplete and virtual seats were empty. As a result, most participants hoped that the fall of 2020 would have higher levels of accountability to attend class and complete assignments.

Additional lessons were also learned about technology and the way it should be utilized. The emphasis on 21st century skills in recent years has resulted in many schools exposing students to technology early in their academic careers. This may have been a reason as to why using technology and tools with which students were already familiar was so successful. The overwhelming majority of participants and their students were using Google Classroom[®] at school *prior* to COVID closures. Therefore, it was not such a shock to students when that became 'home base' for virtual instruction. In addition to having their own Google Classroom[®], many of the participants had access to the general education teachers' Google sites. This made it easier for teachers to monitor students on their caseload and keep track of what was due in general education classes and when. In addition, video tutorials and audiobooks were supports that students had been using for quite some time to help them access curricula. The use of these learning tools continued to be helpful to students following the transition from school to at-home instruction. It was clear that these resources would continue to be utilized, regardless of the instructional configuration.

With increased efforts to address affect and then academics through the leveraging of technology to successfully meet with, support, and provide instruction to students with exceptionalities online, participants in this study planned for the future. The hopes for school, district and/or state mandates to attend and submit work that would contribute to a grade on an official report card were high.

Connections to Current Literature

When comparing results from the present study to those of the past, a number of differences and only few similarities could be observed. This is most likely due to the fact that the nature of events related to COVID-19 were unprecedented, at least during the technology era. The modern world has yet to see a pandemic with effects so pervasive and so extensive for such an extensive period of time. Second, parallels to an already limited research base on homeschooling could not be made as easily for a number of reasons. Even a robust amount of research on effective homeschooling strategies probably could not be generalized to students who went from in-person to online schooling. Forced at-home instruction in a pandemic is entirely different from homeschooling. Homeschooling is a conscious choice for very specific reasons (Taylor-Hough, 2010), is prepared for well in advance by families, and successfully utilizes community resources and collaboration (Anthony & Burroughs, 2012; Sabol, 2018; Thomas, 2016). Many of these were not options or were impossible during COVID-19. For example, community opportunities for learning (which tend to be core components of homeschooling) could not be utilized due to the stay-at-home orders students and families were facing. Schools were not the only buildings whose doors were closed for learning to take place...so were museums, parks, zoos, and aquariums. In addition, parents who homeschool their children are heavily involved in the process. These parents actively collaborate with other parents or homeschool organizations to create the best outcomes for their children (Anthony & Borroughs, 2012; Ray, 2000; Sabol, 2018; Thomas, 2016). This was a striking difference between the findings of this study and those of homeschool research. According to teachers in this study, parental involvement in at-home learning during COVID-19 was lacking significantly. Because parents were limited by work schedules, academic ability, language barriers, or resources, students could not reap many of the benefits that traditionally homeschooled children do.

Results of this study indicated that the flexibility and personalized instruction which have also been cited as advantageous to homeschooled (Sabol, 2018) and online students with exceptionalities (Martenev & Bernadowski, 2016) were only partially beneficial. Participants constantly referred to the abrupt nature of the closures which did not allow time for preparation. As a result, tailored instruction for individual students was not possible. Flexibility did play a big role in this study and was cited as being a successful strategy by teachers. This was similar to homeschool and online teaching research in that flexibility is implemented to support the student. In the case of homeschooling, flexibility referred to scheduling academics around the child's activities and learning preferences (Sabol, 2018; Thomas, 2016). According to participants, flexibility was afforded to students with exceptionalities as a way to relieve stress or anxiety associated with the spreading of the virus, help them cope with abrupt changes, and the unstable home environments where support was often lacking. Flexibility became the primary accommodation for many of these students. While research on effective online instruction for students with disabilities mirrored findings justifying the need for flexibility and self-paced assignments (Murphy, Rodriguez-Manzanares, & Barbour, 2011; Rauh, 2011), there were stark contrasts with regard to taking advantage of online supports. Access to supports, small group instruction, tutors and additional resources were cited as being advantages to students with disabilities attending school online (Repetto, Cavanaugh, Wayer, & Feng, (2010) as cited in Martenev & Bernadowski, 2016) but participants in this study stated that many of their students did not take advantage of what was available to them.

It is important to note that lessons on flexibility and personalized instruction learned in the spring have caused some participants to consider creating online learning plans, more instructional options tailored to the individual, and choices of activities with flexible completion options should virtual instruction and service delivery continue. These practices would be more like those used currently by homeschooling families and families of students with exceptionalities who attend online schools.

Implications

The findings of this study would be relevant to special education teachers who will continue to (or begin to) provide specialized academic instruction to students with exceptionalities either fully or partially online. Practitioners should take the practices, strategies, tools, and programs that were successfully used by the teachers in this study into consideration and then decide whether they would be appropriate for their students. Mild-moderate special education teachers can review these findings and see exactly how some of their colleagues in the field will be approaching virtual models of service delivery and instruction. Educators can then take it upon themselves to decide if any of these approaches would be beneficial to them or their students should schools remain closed. Lastly, knowing what did not work for some teachers and students in districts across the state of California may offer some support for alternative approaches and higher levels of accountability.

Delimitations and Limitations

The primary delimitation of this study is lack of triangulation. Due to the nature of the pandemic and privacy restrictions associated with observations of students and teachers in virtual environments, observation data could not be considered in this study. Interviews served as the only source of data collection in this study. In addition, the unprecedented nature of events prevented the ability to take archival data into account.

The primary limitation in this study was the small sample size of eight participants. The sample was not gender diverse in that seven of the participants were female and only one was a male. In addition, all teachers were serving students with mild-moderate disabilities. Since this was the credential area and area of expertise of the primary investigator, and participants were former or current colleagues and students; teachers of students with moderate to severe disabilities were not included in the study. Thirdly, participants were from school districts in northern, central, and southern California only. There was no representation from special education teachers outside of California. The inability to triangulate data, small sample size, lack of gender diversity, area of specialization, and the lack of representation from other states and unprecedented nature of the pandemic itself limits the generalizability of results.

It was thought that the nature of the primary investigator's relationships to the participants and lack of any conflicting interests created a level of comfort that elicited truly honest responses to questions during phone interviews. However, additional sources of data such as teacher observation, confidential surveys, or parent interviews were not used. Another significant limitation to the study was posed with interview data being the only source of data used to answer the research questions.

One significant limitation of the study was the inability of all participants to review and provide input on the preliminary results and conclusions of the study. Due to heavy demands associated with end of the school year workload and teaching schedules, 2 of the 8 participants were unable to provide their input. Trustworthiness of results was impacted slightly, since not all participants were able to share their responses. However, of the 6 participants who reviewed the results, all 6 stated that they “strongly agreed” with the results of and conclusions of the study and found them to be “very accurate.”

Future Research

At the time this article was being composed, schools still had not reopened to pre-pandemic conditions, which is why additional studies focusing on effective methods of teaching and providing specialized academic services to students with exceptionalities online is needed. Yes, COVID-19 has resulted in some of the most prevalent and prolonged school closures in history, but it was not the first pandemic, and it will not be the last. Schools, families, and educators must be prepared for prolonged periods of at-home instruction during times of immediate crisis. A virus is just one reason to close schools. Any threat to student safety in the world, country, or community would justify at-home instruction. Research addressing successful strategies, practices, programs, and tools will not only be warranted by necessary in order to adequately prepare for those times we do not like to think about but know are inevitable. This does not however mean that service delivery must stop. Students receiving special education services have a legal right to the services in which they are entitled. It is in the best interest of students, families, and I.E.P. team members to determine and then implement practices that can be used for the maximum benefit in school or at home if the need arises.

Conclusion

It is difficult to go anywhere these days without hearing someone say, “Things will never be the same.” For education, that is also the case. COVID-19 has forever changed the landscape of how instruction and special education services should or can be delivered to. Nothing could have prepared today’s teachers or families for what transpired in the spring of 2020. In spite of the abrupt change, much can be learned from special education teachers, families, and students as we navigate uncharted waters into a territory that we may be exploring for quite some time. Emotions need to be addressed *before* academics. Teachers need to meet with students virtually on a regular basis. But it is important to note that special education teachers cannot do this alone. Technology must be leveraged effectively by all parties. Just as special education teachers are being held accountable for providing services, students and families also need to be held accountable for fulfilling individual responsibilities that will maximize the effectiveness of those services. In spite of the ‘new normal,’ the pandemic did not change the one thing that is required for successful instruction and service delivery in special education...and that is the need to work as a team. As in the words of one participant, “We all have to work together.”

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Choosing a Career Path: Moving Beyond the Challenges of Autism Spectrum Disorder

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Abstract

Autism Spectrum Disorder (ASD) is a developmental disability that can cause significant social, communication and behavioral challenges. It is estimated that 1 in 54 children has been diagnosed with ASD (Center for Disease Control and Prevention (CDC) 2020). One area of concern for some parents is food selectivity which can be a common problem among individuals with ASD and often continues into adulthood. For this in-home case study, 13-year-old Michael has ASD, and his underlying cognitive rigidity and sensory issues were impeding his career goal of becoming a dessert chef. Prior to the intervention, Michael ate a very restrictive diet, refusing all fruit, beef, fish, and vegetables. The specific intervention for addressing Michael's food selectivity issues included goal-setting, providing choice-making opportunities, developing and implementing a plan. The results suggest that using choice as an antecedent manipulation may be an effective method for the treatment of food selectivity.

Keywords: Autism Spectrum Disorder, transition, goal-setting, adolescents

Choosing a Career Path: Moving Beyond Autism Spectrum Disorder

Autism spectrum disorder (ASD) is a neurodevelopmental disorder characterized by behavioral deficits in social communication and social interaction, as well as repetitive, rigid, or restricted patterns of behavior, interests, or activities that negatively affect social, occupational, or daily functioning (American Psychiatric Association, 2013). These behaviors manifest in a variety of ways, but one major area of concern is rigidity with food selection. Rigidity with food selection narrows the range of foods one is willing to eat and can involve selectivity based on features such as texture, food group, presentation, or brand (Ledford & Gast, 2006).

Food selectivity, often referred to as "picky eating," is a common problem in children with ASD and is of particular concern because of its negative impact on nutrient adequacy and possible health problems including growth retardation, malnutrition, invasive medical procedures, developmental delays, poor academic achievement, and psychological and social deficits (Bandini et al., 2017; Sharp et al., 2013).

Historically, atypical eating behaviors were once so common in children with ASD that they were considered diagnostic indicators of autism (Ritvo & Freeman, 1978). Although feeding problems are no longer included in the diagnostic criteria for ASD, children with ASD do have significantly greater feeding problems and eat a much narrower range of foods when compared to neurotypical children (Mayes & Zickgraf, 2019). Schwarz (2003) found that most feeding problems in children with ASD can be categorized as either behavioral feeding disorders or sensory-based feeding problems. In addition, the behavioral feeding disorders may include food

refusal, gagging, choking, and expulsion of food. Sensory-based feeding problems may include textural aversions to certain types of foods with greater texture.

In 2010, Williams and Seiverling cited food selectivity as being the most commonly reported and researched problem in children with ASD. Additionally, they noted that children may be selective by food type and texture, temperature, brand, and even color of food. Some less commonly reported feeding problems may include liquid avoidance, packing (retaining food in mouth for long periods of time), and rapid eating (eating so quickly there is no time for chewing before swallowing).

In a recent study by Mayes and Zickgraf (2019), a large sample of children with and without disabilities was assessed to examine the prevalence of limited food preferences and other atypical eating behaviors. Using the Checklist for Autism Spectrum Disorder (CASD), results showed that atypical eating behaviors were significantly more common in children with autism (70.4%) than in children with other disorders (13.1%) and typical children (4.8%). For children with autism who had atypical eating behaviors, the most common behavior was limited food preferences (88%), followed by hypersensitivity to food textures (46%), eating only one brand of food (27%), pocketing food without swallowing (19%), and pica (12%).

Fortunately, there are a variety of procedures available that can help with expanding an individual's food repertoire, such as, repeated taste exposure (Paul et al., 2007; Wardle et al. 2003), consequence-based procedures such as positive reinforcement (Piazza, et al., 2003) and access to preferred stimuli (Luiselli & Gleason, 1987). Typically, intervention plans for food selectivity combine these and other consequence-based and antecedent-based procedures. In order to determine the most appropriate treatment, the cause of the selectivity must be understood.

The causes of feeding problems are often interrelated. Two different behaviors may have the same topography, but if they are not serving the same function, they would be treated differently. For example, refusal to try new foods is a behavior that may have the same topography exhibited by an individual who has a high sensitivity to food textures (e.g., hitting, spitting out food, screaming), but the treatment would be very different for each of these functions of behavior.

Do these feeding problems decrease as the child gets older? In a longitudinal study, Bandini et al. (2017) examined whether food selectivity that is present in childhood persists into adolescence in children with ASD by examining the association between food selectivity and weight status. Results showed a decline in food refusal with age, but the extent of the change was quite variable with half of the children in the study remaining highly food selective. As children with ASD move into adolescence, our role as educators and professionals is to assist these students in overcoming some of the deficits that can make life in general more challenging. It can be even more complicated when these deficits interfere with a person's career goals. This was the case with Michael, a 13-year-old boy with ASD who exhibited cognitive rigidity and sensory issues with certain foods. However, his ultimate career goal was to become a dessert chef.

Method

Participant

Michael was a 13-year-old male 8th grader diagnosed with ASD. He was considered high functioning with an average intellect and had good communication skills. He lived in a single-family home with his stay-at-home mother and his father, who is an engineer. Michael had a very restrictive diet, refusing all fruit, beef, fish, and vegetables. He explained that his aversion to fruit is because of his intolerance to certain textures. For example, he would not try strawberries because he already knew that he would not like the “crunchiness” of the seeds in his mouth. Also, he would not eat bananas because he thinks the texture is too “slimy.” The cognitive rigidity governing this food selectivity may prevent Michael from obtaining his goal to become a dessert chef.

Michael received after-school Applied Behavior Analysis (ABA) services four days a week with the days being split between two therapists. ABA is a science that uses research-based strategies to improve targeted behaviors using scientific methods (Cooper et al. 2020). These strategies are used to focus on improving specific behaviors that may have a negative impact on a person’s daily functioning. These behaviors may include social skills, communication, academics, hygiene, and home and workplace behavior to name a few. Based upon the research that ABA strategies are effective for increasing appropriate behavior and decreasing maladaptive behavior in children with ASD (Cooper et al. 2020), it was surmised that these strategies may be effective in treating Michael’s food selectivity.

At the age of 16, a transition plan has to be included in the student’s Individualized Educational Plan (IEP) (IDEA, 2004). Although Michael was only 13 years old, he had already expressed an interest in working with his therapist to identify postsecondary goals for employment. He loved to cook and discussed his dream of becoming a dessert chef; however, his food repertoire was extremely limited. The therapist had explained that in order to become a dessert chef, one must be willing to taste the foods that you cook and that many desserts contain fruit.

Background

At the beginning of the school year, a parent/team meeting which included two behavioral therapists, both parents, and Michael, was held to discuss Michael’s progress in academic and behavioral goals. During the meeting his parents mentioned that he had never tried fruit, vegetables, fish, or meat. Since addressing Michael’s food selectivity issues had never been a goal prior to this meeting, the therapist who was enrolled in an ABA Graduate Program in ABA approached Michael’s mother after the meeting to ask if focusing on his food selectivity could be added as a goal. The mother agreed so the therapist approached Michael about it during the first session after the meeting. It is important to note that this goal was only added after Michael expressed an interest in becoming a dessert chef, and he agreed that this was a goal he wanted to focus on. Michael’s mother was present for the discussion. This particular behavioral therapist was hired by the family to work with Michael on his behavioral challenges and had been working with him for the past two years.

Procedures

This descriptive case study was implemented in ten sessions over a nine-week period. Three questionnaires were developed and implemented for the purpose of gathering relevant information regarding Michael's food selectivity.

A Food Selectivity Questionnaire (see Appendix A) was developed in order to assess Michael's food preferences. The questionnaire consisted of a juice preferences section and an inquiry question. Incorporating any fruit juices that he had previously tasted, he was asked to rank the juices in order of preference, from greatest to least in regards to how much he liked the taste or thought he might be okay with the taste. A blank was inserted so he could add additional fruit juices. The final part of the questionnaire included an open-ended question about trying new foods.

Michael also completed a Reinforcement Menu (see Appendix B) which had been developed by the therapist based on information that Michael had previously provided on an informal preference assessment. He ranked the reinforcers from greatest to least in regards to the value he placed on each one of them. A blank was inserted so he could add additional items or activities.

Lastly, a Parent Food Selectivity Questionnaire (PFSQ) (see Appendix C) was adapted from Quizán-Plata et al. (2016) for Michael's parents to complete. The PFSQ consisted of a food allergy inquiry, as well as a food frequency inquiry. The food frequency table was classified into two groups, fruits and vegetables, and all foods were sorted alphabetically. Five frequency response categories were established within the table: Daily, Weekly, Monthly, Yearly, and Never. A total of 34 items constituted the food frequency portion of the questionnaire. The questionnaire was used to compare the information Michael had shared regarding his food selectivity issues with his parent's observations.

In coordination with his therapist, Michael developed two goals. The first goal was to do his own grocery shopping with the assistance of his therapist. His second goal was to prepare two recipes, one that contained fruit and one that contained an unfamiliar texture.

The majority of the training sessions with Michael took place in his home once a week with the exception of week five that included two training sessions. The first four sessions, the sixth session and the eighth session each lasted approximately 30 minutes while the fifth session lasted 75 minutes. The seventh session was 45 minutes and the final session was 90 minutes. One session, session nine, included a trip to the local grocery market for Michael to purchase the items he needed to prepare his fruit dessert. The ten sessions of this case study are discussed in the following sections.

Session One, Week One

Time: 30 minutes

During the first session, the therapist and Michael began with an informal discussion on his food preferences and eating habits. He reported that he has never eaten beef, fish, fruits, or vegetables. He added that sometimes certain food textures bothered him. His mother was present, and she confirmed this to be accurate. He has refused all of these foods, and he had never tasted a fruit or vegetable. She indicated that this refusal had nothing to do with allergies or food intolerance. Michael said that he had tasted apple juice. Michael briefly talked about how much he enjoyed

baking, and he expressed interest in becoming a dessert chef. The therapist mentioned that many desserts contain fruit, and explained that it would be important in reaching his career goal if he could learn to cook with and eat some fruit.

The therapist asked Michael if he would like to participate in a cooking project. He could make two desserts, one that had a texture he typically avoided and one that had fruit as an ingredient, and he agreed. The therapist told Michael they would discuss the details during the next session. Also, an informal preference assessment was conducted to provide Michael with the opportunity to think of some reinforcers that he could work toward during the cooking project. He provided a shortlist that included gift cards and playing video games with the therapist.

Session Two, Week Two

Time: 30 minutes

The session began with a follow-up discussion about Michael's future career goal of becoming a dessert chef. He was informed that over the next few months, the sessions would be focused on learning new skills that would assist him in achieving his goal. Further, the therapist mentioned other activities that would provide support for working towards his goals. For example, Michael's school district offers a cooking course at his high school, and Michael was encouraged to look up the program online so that he could view the course objectives and requirements. He was told that if he were to become a student in that program, he must work on reducing his rigidity and increase his flexibility in food selection. In addition, he would have to comply with the teacher's instructions and follow the recipes as assigned. This would also include trying new foods, because a chef always tastes his own dishes. Michael agreed that these things are all important steps he would have to take including expanding the range of foods in his repertoire.

Session Three, Week Three

Time: 30 minutes

At the beginning of the session, Michael completed the Food Selectivity Questionnaire and the Reinforcement Menu. On the questionnaire, he indicated that his reason for not wanting to try new foods was texture. Throughout the session, he often mentioned his rigidity and stated that he wanted to move past it. He was very excited about the possibility of earning a gift card because there was an item on Amazon he wanted to purchase. He indicated that he might like to try more than one new food so he could save up for an even bigger item on Amazon.

At the end of the session, Michael's parents briefly met with the therapist and agreed they should move ahead with the cooking project. At that time, they were given the Parent Food Selectivity Questionnaire, which was to be completed before the next session and returned to the therapist.

Session Four

Time: 30 minutes

During this session, Michael was asked to think of a recipe he could make with support from the therapist. The plan involved three parts. First, he was to choose a recipe, prepare the recipe, and then taste his dessert. Michael was asked to choose a dessert recipe that he had never tried before and that had a texture that he imagined as being "unusual or weird" since he indicated on the questionnaire that he is very sensitive to food textures. He was then told that he would be doing a taste test to see if he liked the food he made with an unusual texture. The therapist reinforced the

fact that, as a chef, being able to taste one's own food is important because chefs always taste their own dishes before serving them to others. The recipe he chose was frozen tiramisu. It did not require baking but it did involve an "unusual" texture. He said that he could not imagine eating tiramisu in a frozen state, but he was curious, and he was willing to try. He searched for a recipe online, and printed a copy of it.

Session Five, Week Five

Time: 75 minutes

Prior to the session, Michael's mother bought the ingredients for the recipe. During the session, Michael made the frozen tiramisu with some assistance from the therapist. A few of the ingredients were missing, so they had to make a few substitutions. Michael was hesitant to be flexible in this regard, but he was reminded that cooks need to be flexible because unexpected issues can arise.

For example, the recipe called for a specific weight package of ladyfingers, but his mother bought biscotti instead. He had to estimate how much biscotti should be used since biscotti is a much heavier biscuit. Another issue arose, as well. One of the ingredients was Kahlua, a coffee-flavored liquor. He was adamant about not being allowed to have any because it contained alcohol, and he would not be able to try the end result if we used the Kahlua. After giving it some thought, he asked if it would be okay because the alcohol would cook out of the tiramisu. The therapist explained that tiramisu is not cooked, so it would not cook out. He expressed some frustration, but the therapist asked him to take out his favorite bottle of vanilla (he is fascinated by different vanilla extracts from various South American countries) and look at the alcohol content. He said that he already knew that there was alcohol in vanilla extract, but the amount was not as much as Kahlua. The therapist assured him that there were just two tablespoons of Kahlua in the entire recipe, and his parents approved it; therefore, it would be okay. He agreed. He was commended on being so flexible throughout the entire cooking session. Since the tiramisu had to freeze overnight, the therapist agreed to return the next day so they could taste the dessert.

Session Six, Week Five

Time: 30 minutes

At the beginning of the session, Michael served the frozen tiramisu to the therapist and himself. He made sure to serve it on decorative plates because he is aware a chef places great importance on presentation. He was delighted with the final product; he said it was delicious. When asked what he thought about the texture of the tiramisu, he said, "it was different, but I'm okay with it being different. The flavor of the tiramisu outweighed any negative thoughts I might have had about the texture." They cleaned their plates!

The therapist drew parallels and talked about how the same surprise might occur when he tries fruit in a recipe. The therapist said, "I'm very proud of you! You did a great job cooking this, and you know a chef always tastes their own dishes before serving it to someone else!" He was very proud of himself. At the end of the session, Michael realized that he had forgotten to put the remainder of the tiramisu back into the freezer. With a little encouragement, Michael decided to try the tiramisu in the current melted state just to see if he liked it in that form. He agreed that it

still tasted good; however, he also agreed that he preferred the texture of the frozen tiramisu over the texture of the melted version.

Session Seven, Week Six

Time: 45 minutes

At the beginning of the session, the therapist told Michael that it was time for him to choose a recipe that contained a fruit as one of its main ingredients. The therapist gave him a copy of his completed Food Selectivity Questionnaire so he could remember which fruits he said he preferred. Michael struggled a bit in his search for an acceptable recipe containing fruit. He began looking on the internet for recipes, but he then asked if the therapist would help him find a recipe containing fruit. The therapist sat next to Michael and they began searching on separate laptop computers.

Michael ultimately decided that he wanted to make a smoothie. He could not find a recipe that he liked, so he decided that he would create his own recipe. He indicated that it had to be sweet, or else he would not like it. He named his recipe, "Sweet Fruit Smoothie," because all of the ingredients that were chosen were sweet. The therapist made suggestions of ingredients for his smoothie, and he agreed to them all. He was especially excited to hear the suggestion of vanilla extract; his parents are originally from Nicaragua, and he decided to use Nicaraguan vanilla extract in the recipe. Since he wanted his smoothie to be sweet, he considered honey or agave as a sweetener and possibly also using sweetened yogurt. He liked the idea of agave since he was not particularly fond of honey. He was still unsure as to which fruits he would want in his recipe. He said he would make his final decision when shopping for the ingredients.

In Between Sessions

The therapist asked Michael's parents for permission to take him grocery shopping during his next session. She also shared her own excitement about their son trying fruit this week. The parents expressed their full cooperation, and indicated that they were also very excited.

Session Eight, Week Seven

Time: 30 minutes

To foster Michael's sense of independence and ensure that he be involved as much as possible in the entire process, a goal was set that he would choose a grocery store and shop for his smoothie ingredients with support from the therapist. During the session, they discussed the shopping trip that they would take together during the next session. Michael listed the items on his grocery list and put it on the refrigerator. He was still unsure about which fruit he wanted to try, so he restated his previous decision to make his final decision regarding the fruit during the shopping trip. He was asked to think about which grocery store he would like to go to, and was told that he could also make the final decision in the next session. His mother privately expressed to the therapist her concern that even if he does eat fruit for this project, that she is concerned that he would never eat fruit or any other new food with her. The therapist said that she would provide some guidance on how to assist Michael with generalizing this new behavior.

Session Nine, Week Eight

Time: 90 minutes

Michael chose Target as the store to do his shopping for the smoothie ingredients. His mother gave him \$60 in cash to buy the ingredients and he put both the money and the grocery list in his pocket, taking care to keep his pocket zipped.

Michael had been told that that he was in charge of picking out the fruit, and the recipe for the smoothie needed to contain at least two fruits. It was surprising that he chose to buy five different fruits to put in his smoothie: strawberries, watermelon, kiwi, oranges, and guava. The therapist agreed to the five different fruits because choice-making was part of the intervention.

Michael expressed excitement to push the cart around the store and find all of his ingredients. First, he picked out the yogurt. He wanted a large container of vanilla yogurt, but they only had plain. When asked if he was certain he did not want to choose a different brand of vanilla because he wanted the smoothie to be sweet, he just said, “Well, what I could do is add extra sweetener to it if it’s not sweet enough.” The therapist praised him for his flexibility. He had difficulty finding a couple of the items at Target, so he found a person with a red Target shirt on and asked, “Excuse me... Could you please tell me where to find _____?” His voice was not very loud when he asked the first time, so the therapist coached him to speak up when asking about the remaining items that he could not find. He was also happy to check out at the self-checkout lane independently. Michael posed for a picture holding the first fruit he was ever going to purchase, and he held up the kiwi with a big smile on his face.

On arriving back at his house, he was responsible for putting away all of the groceries. He wanted a couple of ingredients that were not available at Target, so his mother offered to pick up those ingredients before the next session. It should be noted that Michael remained calm when some of the ingredients could not be found at Target.

Session Ten, Week Nine

Time: 90 minutes

Finally, it was the day of the smoothie-making session, and Michael was very excited. When the therapist arrived, he had all of the ingredients out and ready to use. His mother wanted to participate by just being in the kitchen and providing verbal praise, and since she had expressed concerns about the possibility of his willingness to try new foods as limited to just this project, the therapist thought it would be a good idea. His mother was not able to find guava at any local store, so she bought blueberries. Blueberries were not on his food selectivity list, but he was very open to us using them in a smoothie. Because strawberry smoothies are typically an option at any smoothie bar, he began with a strawberry smoothie first. The therapist directed him to taste it before he added any more fruits. He agreed that it was a good idea. The therapist instructed Michael on how to clean and cut each of the fruit. He enjoyed using a unique kitchen tool that that was designed specifically for taking the stems off of strawberries.

After he prepared the strawberry smoothie, Michael shared a taste of the smoothie with his mother and the therapist. Michael also tasted the smoothie and exclaimed that “It was delicious!” He mentioned the seeds and said it was too bad that we could not strain the seeds. When asked if the delicious flavor outweighed the taste of the seeds, he agreed that it did. Next, the therapist

suggested that he add in blueberries since mixed berry smoothies are also popular, and he might like to try one at a smoothie bar one day. He agreed.

After preparing and tasting many different fruit smoothie drinks, he chose the mixed berry smoothie as his favorite. The orange smoothie was more challenging to drink due to its texture which was not appealing to any of the taste-testers. Michael decided to strain the orange smoothie to see if removing the orange pieces/pulp would make it taste any better. He said it did not taste better. However, it was encouraging to see Michael come up with a possible solution, try it out, and then do a taste test. The therapist praised Michael for exploring a possible solution and told him that this is what chefs do when they cook and develop new recipes. His mother also offered words of praise and encouragement regarding his willingness to create new recipes and taste test his creations.

Michael expressed how much he enjoyed making the fruit smoothies and having his mother and the therapist try his smoothies. The therapist took pictures of Michael holding a smoothie in one hand and fruit in the other hand. He was already talking about how he would like to try guava next time, and possibly different fruit. After cleaning up the kitchen, Michael decided he would choose the \$20 Amazon gift card as his reward.

Discussion

At the conclusion of 10 sessions, Michael was successful at choosing a recipe, making a grocery list, going to the store to purchase ingredients, with support from his therapist, preparing, tasting, and sharing his tiramisu. In addition, he made a variety of fruit smoothies to taste and share as well. Michael was willing to address his underlying inflexibility and sensory issues, and was able to expand the range of foods in his repertoire.

This descriptive case study consisted of several components that were key to the success of the cooking project. In collaboration with Michael, they included goal-setting, providing choice-making opportunities, developing a plan for implementation, and carrying out the plan. Granted, Michael had support from his therapist when needed. Because of the mother's concern about Michael's willingness to participate in the project as being an isolated incident, the therapist included his mom when appropriate. Thus, his mother was able to participate and provide verbal support to Michael as he prepared the desserts and shared them.

Goal-setting and choice-making opportunities were crucial elements of this intervention. Providing choice-making opportunities has been shown to be effective in addressing aberrant behavior (Wehmeyer et al. (2007). Choices increase the likelihood of engagement with a task, and studies have shown that individuals with disabilities prefer choice-making opportunities over situations where a choice is not offered. According to Fisher et al. (1997), "Choice may produce a reinforcement effect because it is correlated with differential consequences (i.e., choice may increase one's access to higher preference stimuli), or it may have reinforcement value independent of (or in addition to) the chosen stimulus" (p. 423). Because personal preferences can fluctuate on a momentary basis, providing Michael with a choice from an array of reinforcers should ensure that the delivered reinforcer is the most preferred reinforcer at that particular moment. The choices individuals make shape who they are. Given the previous research on the

advantageous effects of choice as an antecedent manipulation, it would make sense that choice-making opportunities could empower Michael by giving him a role in addressing his own food selectivity.

Shevin and Klein (2004) reviewed a number of studies and estimated that making choices based upon one's expressed preferences is a crucial part of functioning independently as an adult, and that "learning to make choices can extend to areas of major life concerns such as vocation, residence, and consent to medical treatment, as well as to relatively minor, but cumulatively significant day-to-day decisions such as choice of recreational activities, partners for social activities, food, clothing, music, seating, and scheduling" (p. 161).

The outcome of the intervention was significant for Michael. Not only did he taste one fruit, but he tasted a total of five different fruits, knowing that the amount of differential reinforcement would be the same either way. Even more encouraging was how, at the end of the tenth session, he was talking about what fruit he would like to try the next time he prepares a recipe. The results suggest that this approach allowed him to move beyond his cognitive rigidity and reach his goal of preparing and tasting a recipe containing fruit and an unfamiliar texture. Hopefully, this experience will encourage Michael to continue expanding his food repertoire.

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Appendix A
FOOD SELECTIVITY QUESTIONNAIRE

Juice Preferences

Please rank from 1 to 14 the items you like the most: 1 for like the MOST and 14 for like the LEAST.

- ☐ Apple
- ☐ Lemon Lime
- ☐ Melon
- ☐ Orange
- ☐ Strawberry
- ☐ Pineapple
- ☐ Cherry
- ☐ White grape juice (green grapes)
- ☐ Purple grape juice (red grapes)
- ☐ Lemon
- ☐ Kiwi
- ☐ Guava
- ☐ All fruits combined in a punch (please list fruits in the punch)

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Other fruits not listed: _____

Appendix B
Reinforcement Menu

Please rank from 1 to 10 the items you like the most: 1 for like the MOST and 10 for like the LEAST.

- ☐ Bowling
- ☐ Ice Skating @ iON
- ☐ Video games with Dave or Ms. Lynn
- ☐ \$20 AMAZON gift card
- ☐ Professional ball game
- ☐ Go to restaurant of your choice with Dave or Ms. Lynn
- ☐ Go to museum with Dave or Ms. Lynn
- ☐ ½ hour of FREE computer time during an ABA session

Other: _____

Other: _____

Question:

Why do you sometimes have a difficult time trying new foods?

Appendix C
Parent Food Selectivity Questionnaire

Please indicate any known food allergies:

Food frequency: Approximately how much of these foods did your child eat this past year?

Food	Daily	Weekly	Monthly	Yearly	Never	Quantity
Apple						
Banana						
Cantaloup						
Grapefruit						
Grapes (green)						
Grapes (red)						
Guava						
Honeydew						
Kiwi						
Lemon						
Lime						
Mango						
Orange						
Pear						
Pineapple						
Strawberry						
Tangerine						
Watermelon						
Other:						

Adapted from Quizán-Plata, T. (2016)

Preview-View-Review: Increasing Academic Access for Students with Severe Disabilities who are English Learners

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Abstract

This study measured the effect of an evidence-based science curriculum delivered in both English and Spanish using the *preview-view-review* (PVR) strategy, on the science vocabulary and content knowledge acquired by students with moderate to severe intellectual disabilities who were learning English. The intervention was compared to the same research-based science curriculum delivered in English only. Using an adapted alternating treatments design, both the English and PVR interventions were delivered concurrently via different, but equally challenging lessons on cells (English only) and precipitation (PVR—English and Spanish). Results indicate that both the English-only and PVR (English and Spanish) interventions were effective in teaching science vocabulary words and pictures to English learners with ID. Although there was no measurable difference in the amount of student participation between the two conditions, there was a noticeable difference in the quality of discussion and participation by the students when taught in the PVR condition.

Preview-View-Review: Increasing Academic Access for Students with Severe Disabilities who are English Learners

The United States has experienced a significant growth in the number of families leaving their home countries to settle in America (U.S. Census, 2010). Researchers have projected that students who are learning English will account for 40% of the overall school population by the year 2030 (Guglielmi, 2012). As a result, there is a growing need for educators to provide instruction to students who are not proficient in English (Protheroe, 2011). To meet this need, researchers and educators have developed methods and strategies to address the needs of students learning English (Rohena, Jitendra, & Browder, 2002).

Preview-view-review (PVR) (Lessow-Hurley, 2013; Mercuri, 2015) is an instructional strategy in which the teacher introduces a lesson in the student's native language (P), teaches the lesson in English (V), and facilitates the closing activity in the student's native language (R). The PVR method allows learners for whom English is not their first language to become familiar with the vocabulary and concept of the lesson in their native language (L1) prior to instruction, thereby

increasing their understanding of the content. The body of the lesson is taught in English (L2), and the closure and discussion are conducted in Spanish (L1). This instructional format allows students to use their native language to demonstrate their understanding of what they have learned (Mercuri, 2015).

Strategies designed to help students become proficient in English often are less effective when they have disabilities (Spooner, Rivera, Browder, Baker, & Salas, 2009). Typically, students with disabilities fail to acquire a second language in the same sequence or at a rate comparable to that of their peers without disabilities (Rohena et al., 2002). Many students with disabilities learning English are not proficient or literate in their native language, making it even more difficult for them to begin to develop proficiency in English (Zetlin, Beltran, Salcido, Gonzalez, & Reyes, 2011). Students with severe disabilities who are learning English are frequently placed in monolingual special education classes with limited access to ESL supports (Harry, Grenot-Scheyer, Smith-Lewis, Park, Xin, & Schwartz, 1995). These students often have a difficult time shuffling between the cultural values of their home and the social and behavioral expectations of school (Rogers-Adkinson, Ochoa, & Delgado, 2003). This confusion is further compounded when these students must communicate with family in one language while trying to learn academic content in English, especially when their comprehension is limited by their lack of academic English proficiency (Duran & Heiry, 1986; Mueller et al., 2006; Reed, 2013).

In the last ten years, the number of non-native English speakers living in the United States has increased by over 40 percent (U.S. Census, 2010) and the incidence of intellectual disabilities and autism is the same across demographic groups regardless of native language (Centers for Disease Control, 2012). Despite the rapid increase in the number of students with severe disabilities learning English enrolled in public schools, educators are unaware of effective practices for teaching language and literacy to students with severe disabilities who are learning English (Rohena et al., 2002; Spooner et al., 2009). Most of the existing research on effective methods for teaching students learning English was conducted with typically developing students (Spooner et al., 2009). In the field of special education, the majority of the English as a second language (ESL) research focuses on students with learning disabilities (LD) (Rivera, Wood, & Spooner, 2012). In the absence of a strong compendium of research-based practices for students with severe disabilities who are learning English, teachers must adapt strategies geared to a different population (Mueller, Singer, & Carranza, 2006). This results in instruction that is directed at the level of the disability without accounting for student language needs (Klingner & Soltero-Gonzalez, 2011), thereby limiting these students' access to academic content (Knight, Browder, Agnello, & Lee, 2010) and negatively impacting their educational outcomes (Spooner et al., 2009).

The Every Student Succeeds Act (ESSA, 2015) explicitly outlines literacy in science as an outcome for students with and without disabilities, and the Individuals with Disabilities Education Act (2004) mandates that students with disabilities have access to general education curricula. Based on these mandates, there has been an increased interest in implementing evidence-based practices to teach academic skills to students with severe disabilities (Spooner, Knight, Browder, & Smith, 2012). Although still limited, there is a growing body of research on effective methods for teaching science to students with intellectual disabilities. Systematic instruction (e.g., task analytic instruction, constant time delay) has been used across all settings

to teach science and other academic content to students with intellectual disabilities (Ahlgrim-Delzell, Knight, & Jimenez, 2009; Browder, Trela, Courtade, Jimenez, Knight, & Flowers, 2012; Knight, Spooner, Browder, Smith, & Wood, 2013; Hudson, Browder, & Jimenez, 2014).

The teaching of academic content to students with severe disabilities is made more complex when the student is learning English. Research indicates that the use of native language support is a critical component of effective instruction for all students learning English (Hart, 2009; Kummerer, 2010; Mueller et al., 2006; Slavin & Cheung, 2003). The majority of research supports the effectiveness of bilingual instruction to promote the acquisition of language and literacy for students learning English (Echevarria, 1995; Hoover, Klingner, Baca, & Cervantes, 2008; Kummerer, 2010; Peregoy & Boyle, 2008; Thomas & Collier, 2003; Wong-Fillmore, 1991). When these students receive instruction in their native language and English, they develop fluency and proficiency in both languages (Mercuri, 2015).

This study was designed to measure the effect of a published evidence-based science curriculum (*Teaching to Standards: Science*; Courtade, Jimenez, Trela, & Browder., 2008) delivered in both English and Spanish using the *preview-view-review* method (Lessow-Hurley, 2013; Mercuri, 2015) on the science vocabulary and content knowledge acquired by students with moderate to severe intellectual disabilities who were learning English. This intervention was compared to the same research-based science curriculum delivered in English only. The study used a single subject adapted alternating treatments design (AATD) using multiple probes across skill sets (Holcombe, Wolery, & Gast, 1994).

Methods

Participants

Three middle school students with moderate to severe intellectual disabilities and limited English proficiency participated in this study. To be eligible, the students had to meet the following criteria: (a) qualify for special education services as a student with moderate or severe intellectual disability (NAC 388.055, 2000), (b) have a current Individualized Education Plan (IEP), (c) have a current educational placement in a self-contained program for students with intellectual disabilities, (d) be a native Spanish-speaker, and (e) have achieved a score at or below the initiating, exploring, or engaging levels of English proficiency as measured by the *WIDA Alternate Access for ELLs* assessment (WIDA, 2012). See Table 1 for student demographic information.

Table 1
Participant Demographic Information

Student	1	2	3
Gender	Male	Female	Male
Age	14	14	12
IQ	52	54	46
English Proficiency Level	P1-Entering	P1-Entering	P2-Emerging
Disability	ID	ID	ID

One special education interventionist implemented the lessons and delivered the instructional probes. The interventionist was a university-based graduate assistant, fluent in Spanish, and had four years of teaching experience. She was not the classroom teacher and had never worked with the subjects prior to the intervention.

Setting and Materials

The study was conducted in a self-contained classroom for students with moderate to severe intellectual disabilities in an urban middle school. There were 14 students in the class for most of the day, receiving a functional curriculum delivered by one special education teacher and one paraprofessional in either whole group or small group format. The probes and science instruction were delivered at the same time each day with the lesson in English being given first, followed by the lesson in English and Spanish using *preview-view-review* (PVR).

The published curriculum used in this study was a standards-based science program developed for students with developmental disabilities. The *Teaching to Standards: Science (TtSS)* (Courtade et al., 2008) is based on the National Science Education Standards and uses scripted inquiry lessons paired with systematic instruction strategies including corrective feedback, time delay, and specific praise. It is comprised of an implementation guide containing the units of study, procedures and scripts for individual lessons, and progress monitoring forms to measure student mastery of vocabulary and concepts. The two lessons used in this study were on cells and precipitation. Permission was granted by the publisher to use all parts of the curriculum in this study. All lessons, assessments, and probe sessions were video recorded and reviewed daily.

Baseline, Intervention, and Maintenance Probes

The baseline and maintenance probes were developed using the vocabulary and conceptual questions taught in the lessons. Each lesson contained five unique vocabulary words and pictures that were used repeatedly throughout the unit. The lesson on cells contained the word cards and pictures for cell, cell division, bacteria, disease, and nutrition. The lesson on precipitation contained words and images for precipitation, evaporation, condensation, conservation, and pollution. The vocabulary assessment materials were a series of single-sided cards, with one vocabulary word on a card and a series of identical single-sided cards with a picture representing the vocabulary word. The student was asked to (a) identify a vocabulary word, (b) identify a picture, and (c) match the vocabulary word to the corresponding picture. Student responses were recorded.

The science content questions consisted of the five assessment questions asked at the end of the *ScienceWork* (Courtade et al., 2008) story that was paired with each lesson. A series of questions with an array of possible answers were presented to the students. The questions on cells were in sentence format with picture symbols to support comprehension, and each question had three possible answer choices consisting of pictures with captions. The precipitation assessment presented students with a temperature in degrees Fahrenheit and asked them to choose whether rain or snow would fall at that temperature, with rain and snow in picture format. Each student was presented with one question and the respective field of two or three possible answers at a time. Student responses were recorded.

Two weeks before the beginning of instruction, the students were probed on the vocabulary and concepts included in the study to establish a baseline. Probes were given in English for the lesson on cells, and in Spanish for the lesson on precipitation. The vocabulary word cards were presented to each participant one at a time and the interventionist asked, “What word is this?”, or “¿Qué palabra es esto?” depending on the condition. Students were praised for attending and participating regardless of the correctness of the answer.

Once all the words were presented to the student, the trial moved to the picture identification probe. The interventionist presented individual pictures that represented the vocabulary words used in the lesson, and then asked, “What picture is this?”, or “¿Qué imagen es esto?” depending on the condition. Again, students were praised for participating.

Once all the pictures had been presented to the student, the trial moved to the vocabulary/picture matching sequence. The interventionist presented a vocabulary word with an array of three pictures and gave the direction, “Which picture goes with this word?”, or “¿Qué imagen va con esta palabra?” depending on the condition. Students were praised for their participation, and the trial moved onto the content knowledge probe session.

In this probe session, the interventionist presented questions relating to the passages from the *ScienceWork* (Courtade et al., 2008) book entitled “*Cells mean life*” or “*The different forms of precipitation*” to assess student ability to answer five questions that followed each passage. She presented one question at a time along with two or three possible answer choices. Students were asked to point to the best answer and praise was provided for attention and participation. This concluded the probe sessions.

During the intervention phase, the interventionist conducted probes each day following instruction to assess student knowledge of key vocabulary and content. Probes were conducted on all words, pictures, and content in English first, followed by all words, pictures and content in Spanish. A single maintenance probe was administered to each student following the conclusion of the intervention. Two of the participants were assessed two weeks after the conclusion of the intervention, while the third was assessed three weeks post-intervention. These maintenance measures were conducted by the interventionist in English for the lesson on cells, and in Spanish for the lesson on precipitation.

Research Design

After establishing a baseline, an adapted alternating treatments design with multiple probes across skill sets and participants was implemented (Holcombe, Wolery, & Gast, 1994). The adapted alternating treatments design (AATD) was selected because it is appropriate for comparing the relative effectiveness of two interventions on functionally independent behaviors or skills of equal difficulty (Holcombe, Wolery, & Gast, 1994). All students received instruction on two different lessons from the *TtSS* (Courtade et al., 2008) curriculum (cells and precipitation). These lessons were selected based on the absence of overlapping content. The lesson on cells was taught in English in the first treatment condition, and the lesson on precipitation was taught in Spanish and English using PVR in the second treatment condition.

Procedures

The intervention phase of the study was six weeks, with both treatment conditions running concurrently. For the lesson on cells, all instruction (e.g., prompting, feedback) was given in English throughout the entire lesson. For the lesson on precipitation, the interventionist used the *preview-view-review* strategy to supplement the lesson, using Spanish to preview the lesson and conduct the closing activity and delivering the body of the lesson in English. The lesson on precipitation was implemented directly following the lesson on cells because the adapted alternating treatments design allowed for both instructional conditions to run concurrently. Instruction, prompting, and feedback was given in Spanish in the PVR condition during the introduction and closing and in English during modeling and guided practice, using the *preview-view-review* strategy.

Vocabulary instruction. Before beginning a lesson, the interventionist explicitly taught vocabulary by using a 0-second time delay, fading to a 5-second time delay. When the array of three word cards was presented to the students, the interventionist said, “Point to the word _____” or “Toca la palabra _____” (depending on the condition). If the students responded correctly, the interventionist gave praise (e.g., You pointed to ____!). If the students responded incorrectly or failed to respond, the interventionist provided a model by pointing to the correct word and labeling it (e.g., This is ____, point to ____, say ____). When all students correctly identified the word, the interventionist moved on to the next word.

After presenting all of the vocabulary words, an array of three picture cards illustrating the vocabulary was presented to the students. Using a 0-second time delay, fading to a 5-second time delay, the interventionist said, “Point to the _____” or “Toca la/el _____” (depending on the condition). Error correction procedures were consistent with those used in the previous sequence. Once all students identified the picture correctly, the interventionist moved on to the next picture.

Following the picture labeling exercise, the vocabulary words and an array of three picture cards were presented to the student. Using a 0-second time delay, fading to a 5-second time delay, the interventionist said, “Which picture goes with this word?” or “¿Qué imagen va con esta palabra?” (depending on the condition). Error correction procedures were consistent with those used in the previous sequence. Once all students matched the correct picture to the word, the interventionist moved on to the next word/picture combination. Upon conclusion of vocabulary instruction, the interventionist taught the actual lessons to the students and guided their participation during the lesson.

Science instruction. The lessons, in both conditions, were broken down into three segments and targeted one of the three skill sets. Each segment was divided into three instructional sections: (a) introduction/demonstration, (b) guided/independent practice, and (c) discussion/closure. In the PVR condition, the introduction/demonstration and discussion/closure were conducted in Spanish using the *preview-view-review* strategy. Instruction for each lesson segment took approximately 10 minutes and was repeated daily. Each skill set consisted of 3-5 steps that led the students through an experiment and inquiry-based science lesson. After teaching the first lesson segment and corresponding skill set for one week, the interventionist incorporated the next lesson segment and skill set each week using a forward-chaining sequence. See Table 2 for a description of the components of each skill set.

Table 2

Participation Skill Sets

Skill Set 1	Skill Set 2	Skill Set 3
Identify materials	Say how you can find out	State discovery
Say what you know	Predict what will happen	Say what you found out
Say what you want to know	Compare examples	Say why it happened
Identify similarities	Say what you learned	
Identify differences		

Skill set one. The interventionist introduced this skill set by showing objects, pictures, and other materials related to the content of the lesson and asked the students to name each picture, object, or material. The students then reviewed what they already knew about each item. Their answers were transferred to the *Know* column of the KWHL chart used in the lesson. The interventionist then asked the students what they wanted to know about the materials and entered their responses in the *Want to know* column on the KWHL chart. Spanish was the language of instruction during the introduction and conclusion of this skill set in the PVR condition.

Skill set two. During this segment of instruction, the interventionist reviewed the content and tasks in the first lesson segment by referring back to the information students had added to the KWHL chart to ensure they maintained the information and skills previously taught. Students then brainstormed how they could find out about the question posed in the “W” column on their KWHL chart. Students could answer orally and/or point to the appropriate response on their Student Response Guide. The students then made predictions of what they thought would happen when their experiment was completed. An example and a non-example of the scientific principle being taught were provided. Following this, the hands-on inquiry phase of the lesson began. As the interventionist guided the students through the scientific inquiry process, they looked for similarities and differences between the example and non-example to compare and contrast different components or phases of the experiment. The lesson concluded with a discussion of similarities, differences, and conclusions, using Spanish instead of English for the introduction and conclusion in the PVR condition.

Skill set three. In this segment of instruction, the interventionist reviewed the content and tasks in the first and second lesson segments to ensure that students maintained the information taught. The students next answered questions about what scientific discovery they made. This included a step-by-step review of the procedures of the experiment. They were then asked what they learned, with the instructor connecting their answers to the predictions made on the KWHL chart. The results of the inquiry lesson were reviewed and the KWHL chart was completed and discussed. Spanish was the language of instruction during the introduction and conclusion of this skill set in the PVR condition.

Science content instruction. In the third and final lesson segment, the interventionist taught science content using a procedure that included a 0-second time delay, fading to a 5-second time delay. The interventionist read the passages from the *ScienceWork* (Courtade et al., 2008) book

entitled “*Cells mean life*” for the English condition or “*The different forms of precipitation*” for the PVR condition. The story and questions for the precipitation lesson were presented in Spanish. Students were asked to answer five questions following the passage by pointing to the best answer. Error correction and reinforcement procedures were consistent with those used during vocabulary instruction. Once all students selected the correct answer, the interventionist gave praise and moved on to the next question.

Fidelity and Reliability Measures

Student reliability data (e.g., skill acquisition, participation) and interventionist fidelity data on the implementation of the science curriculum and the *preview-view-review* strategy were reviewed by the researcher and two doctoral students. Fidelity checks were conducted independently by each observer via student response data collection sheets and procedural fidelity checklists. Treatment fidelity was calculated using the formula $[\text{instructional components implemented correctly} / (\text{instructional components implemented correctly} + \text{instructional components implemented incorrectly}) \times 100 = \text{percent of treatment fidelity}]$ for a mean rate of 98.3% fidelity across all phases of implementation. Interrater observer data were calculated across a randomly selected 25% of the videotaped sessions of probes and daily instruction using the formula $[\text{agreements} / (\text{agreements} + \text{disagreements}) \times 100 = \text{percent of fidelity observer reliability}]$. Interrater reliability across all measures fell between 98.6% and 100%.

Results

This study was designed to measure the effect of an evidence-based science curriculum, delivered in both English and Spanish, using the *preview-view-review* (PVR) strategy, on the science vocabulary and content knowledge acquired by students with moderate to severe intellectual disabilities who were learning English. Six sets of data (i.e., baseline 1, baseline 2, intervention 1, intervention 2, maintenance 1, and maintenance 2) were analyzed to compare the effect of science instruction in English to science instruction using the *preview-view-review* (PVR) strategy (in English and Spanish) on each of the dependent variables (i.e., word identification, picture identification, word-to-picture matching, content knowledge). Each participant’s mean, range, and standard deviation were calculated for the baseline and intervention data sets as was the percentage of non-overlapping data (PND) and mean increase (MI) between baseline and intervention. The percentage of non-overlapping data (PND) is a formula used to measure the effect magnitude of single-subject research (Scruggs & Mastropieri, 1998). As there was only one maintenance probe for each condition, there are no descriptive statistics for this measure.

On the dependent variable of vocabulary word identification, participants 1 and 3 had mean increases of 4.04 and 3.83, and PND levels of 96% and 100% respectively in the English condition. They also demonstrated mean increases of 3.32 and 3.18, and PND levels of 92% and 91.3% respectively in the PVR condition, indicating that both the English and PVR interventions were very effective in teaching them to read science vocabulary. The English intervention also was very effective for Participant 2, as she had a mean increase of 4.13 and a PND level of 100%. However, she struggled slightly with the more difficult vocabulary in the Spanish intervention, achieving a mean increase of 2.86 and a PND of 76.2%, which is considered to be moderately effective. All participants maintained a level of 5 out of 5 correct on the English cell

vocabulary maintenance probe. Participants 2 and 3 maintained a level of 5 out of 5 correct on the PVR precipitation vocabulary maintenance probe, while Participant 1 maintained a level of 4 out of 5 correct. Graphs of all participants' vocabulary word data are shown in Figure 1 (English – Cells) and Figure 2 (PVR – Precipitation).

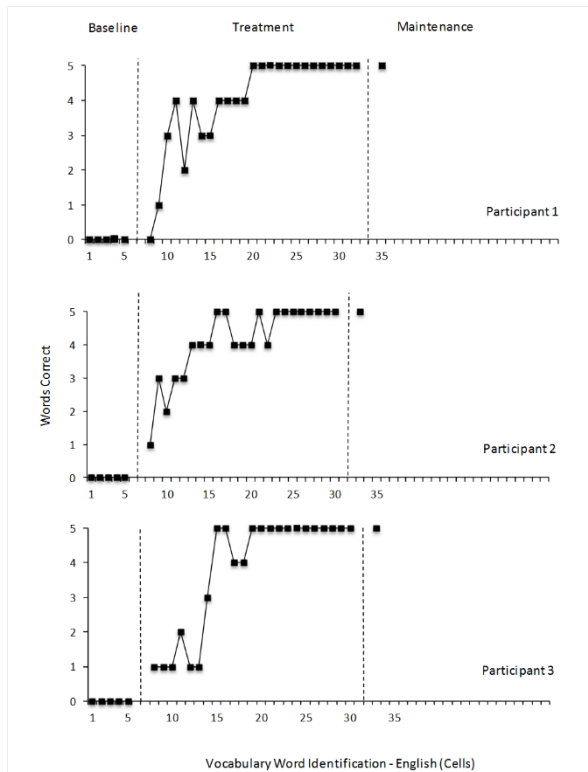


Figure 1. Word Identification (English)

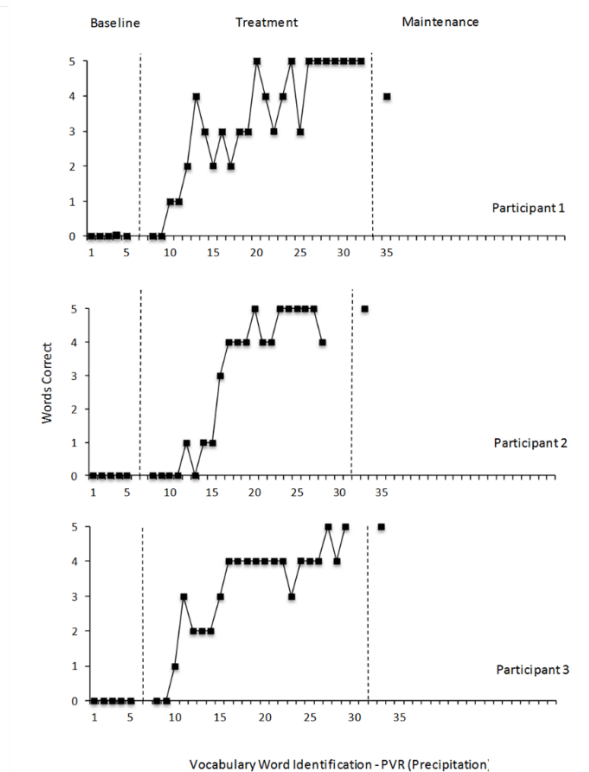


Figure 2. Word Identification (PVR)

On the dependent variable of vocabulary picture identification, participants 1, 2, and 3 showed mean increases of 3.16, 4.13, and 3.48 and PND levels of 96%, 100%, and 100% respectively in the English condition, meaning that the English intervention was very effective for all three. Participants 1 and 2 demonstrated mean increases of 2.08 and 2.96, and PND levels of 82% and 82.6% respectively in the PVR condition, indicating that the PVR intervention was moderately effective in teaching them to identify science picture vocabulary. The PVR intervention was very effective for Participant 3, as he had a mean increase of 3.04 and a PND level of 90.9%. All participants maintained a level of 5 out of 5 correct on the cell picture maintenance probe. Participants 2 and 3 maintained a level of 5 out of 5 correct on the precipitation picture maintenance probe, while Participant 1 maintained a level of 4 out of 5 correct. Graphs of all participants' vocabulary picture data are shown in Figure 3 (English – Cells) and Figure 4 (PVR – Precipitation).

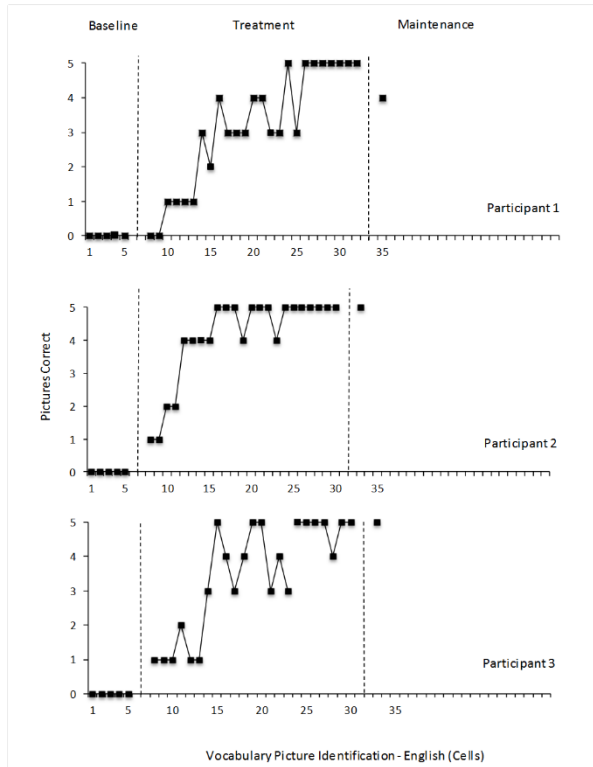


Figure 3. Picture Identification (English)

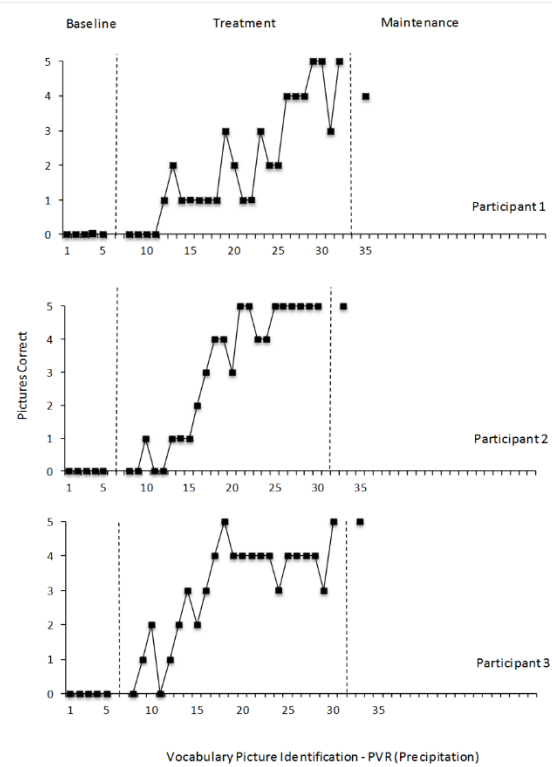


Figure 4. Picture Identification (PVR)

On the dependent variable of word-to-picture matching, participants 2 and 3 attained a mean increase of 2.96 and 2.82 respectively, and both had PND scores of 100% in the English condition, making the intervention very effective for both. The English intervention was minimally effective for Participant 1, as he had a mean increase of 2.84 but a PND level of only 68% due to a high data point in baseline. Participant 2 had a mean increase of 2.95 and a PND of 100% in the PVR condition, indicating that the Spanish intervention was very effective for her. However, although participants 1 and 3 had mean increases of 1.12 and 2.69 respectively, their PND scores were 64% and 68.2% in the PVR condition, meaning that for them the Spanish intervention was minimally effective. Participants 1 and 2 maintained a level of 5 out of 5 words correct on the word-to-picture matching maintenance probes in both conditions, while Participant 3 maintained a level of 3 out of 5 words correct in both conditions. Graphs of all participants' vocabulary word-to-picture matching data are shown in Figure 5 (English – Cells) and Figure 6 (PVR – Precipitation).

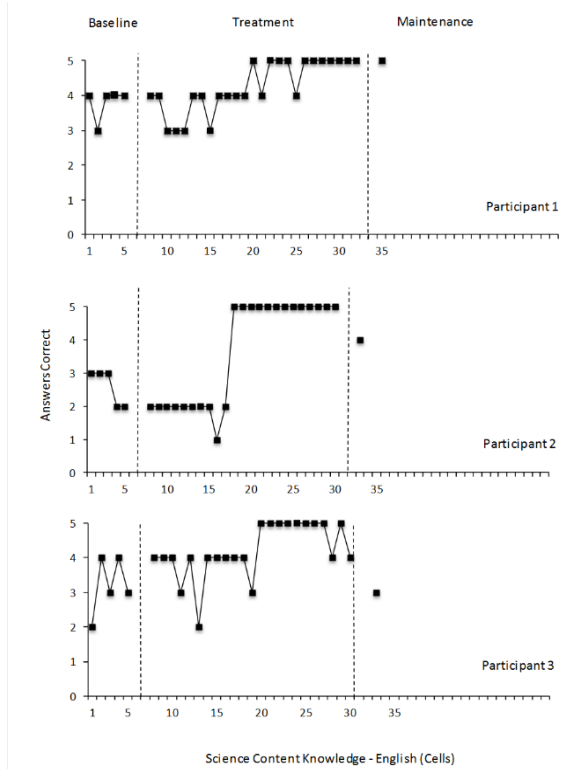


Figure 7. Content Knowledge (English)

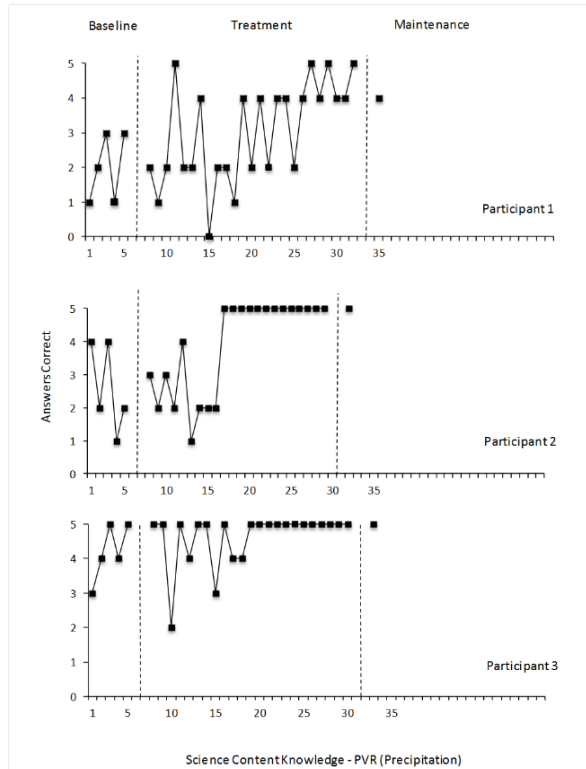


Figure 8. Content Knowledge (PVR)

In addition to academic measures, data on students' active engagement in each step of the lessons were aggregated to determine an overall participation performance score across the total number of opportunities to participate in each condition (see Table 2). As these skill sets were only measurable during the actual lesson delivery, there are no baseline or maintenance measures for this research question. All three participants had a 100% rate of participation in all components of the lessons in both conditions. They were active and engaged in both English and Spanish as the content of the lessons was novel, and the interventionist had established a high level of rapport with the students.

Discussion

Based on the results of this study, both the English-only and PVR interventions were effective in teaching science vocabulary words and pictures to English learners with ID. This is likely the result of the structure and instructional design of the research-based science lessons developed by Courtade et al. (2008). This corroborates the findings of Rohena et al. (2002) in that time delay and systematic instruction were effective in teaching English vocabulary words and incidental information to this population regardless of the language of instruction. Neither intervention produced a significant difference in student content knowledge. This may be due to the simplicity of the questions and the artificially high baselines created by the students' guessing correctly in baseline. Additionally, the content questions did not accurately represent the full scope of content that was taught in the context of each lesson. For example, there was a question on fossils, yet fossils were not addressed until a later lesson in the unit. There was also a

great deal of information that the students learned in the precipitation lesson, but snow and temperature were not addressed in the lesson itself.

Contrary to the findings of Duran and Heiry (1986), students showed no measurable additional gains in learning when Spanish was incorporated into instruction. While the addition of Spanish in the PVR condition did not produce significantly higher outcomes than the English-only instruction, it also had no negative effects on student learning. This contradicts the misconception that introducing native language into instruction is confusing to the students and prevents them from learning new vocabulary or concepts (Protheroe, 2011).

The students were active participants in both conditions. This may be due to the enthusiasm of the interventionist and the structure of the inquiry-based lessons, both of which created many opportunities for student participation. While there was no measurable difference in the amount of participation between the two conditions, there was a noticeable difference in the quality of discussion and participation in the PVR condition. This was likely due to the level of comfort felt by the students, as they were allowed to choose their language of response, knowing that their answers would be acknowledged in either language. This is similar to the findings of Corcoll (2013) and Gonzalez-Davies (2014) who found that students provided richer responses and deeper conversations when classroom discourse incorporated their native language.

Limitations and Recommendations for Further Study

This study added to the existing literature in the field of instructional methods for students with intellectual disabilities who are learning English (Duran & Heiry, 1986; Rohena et al., 2002; Spooner et al., 2009; Rivera et al., 2013; Reed, 2013). More importantly, it serves as a pilot study on effective methods for teaching science to students with ID who are learning English, as there has been no previous research incorporating EL strategies to date. However, due to the small sample size and the limited content knowledge assessment measures, the results cannot be generalized to a larger population at this time. It would be beneficial to replicate this study on a larger scale with more challenging content taught over a longer period of time to determine whether there would be any significant difference between teaching conditions. To address the small sample size, this would involve the scaling up of the study and would involve more bilingual interventionists as suggested by Mueller et al. (2006).

Although the students achieved significant increases in word and picture vocabulary identification in both conditions, there was no measurable difference in the effectiveness of the PVR condition as compared to the English-only condition. There may have been several contributing factors, such as the more difficult vocabulary in the PVR condition (precipitation), or the fact that there were only five word/picture combinations and five content questions for each lesson, making it easy to master all dependent variables in both conditions. Also, the lesson on cells (English-only) was always taught first, which may have left the participants exhausted by the time they were probed on precipitation (PVR). Counterbalancing the conditions may have neutralized this effect, as recommended by Holcombe et al. (1994). An additional limitation of the study was the absence of any type of social validity measure, which is an important factor to consider when developing interventions for students with disabilities.

Future studies should examine the elements of the intervention independently to determine which individual instructional elements have the greatest impact on student learning. This would include time on task as an outcome, to determine which instructional methods produce the highest percentage of engagement. Finally, given the large number of students with disabilities who are learning English in public schools, future research should focus on identifying effective instructional methods to teach different domains of academic content to this population. Studies should be conducted to apply bilingual strategies, like PVR, to academic instruction in all subject areas, as suggested by Mercuri (2015).

While much more research is needed in this area, the current study can serve as the foundation for future investigation of effective methods for teaching academic content and concepts to students with ID who are learning English. The ethical goal for students with intellectual disabilities who are learning English is access to the general education curriculum and the experience of a successful education.

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Beating the Odds: How Six Post-Secondary Learners Overcame Common Challenges of Attention Deficit Hyperactivity Disorder

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Abstract

Students with ADHD are less likely to enroll in a 4-year college than their neurotypical peers. Persons with Attention Deficit Hyperactive Disorder (ADHD) are characterized not only by executive function challenges but social-emotional and coping struggles. These deficits can lower resilience and cause maladaptive traits to form that lower chances of success in school. This study aimed to examine the commonalities in the personal histories of six adults with ADHD who have attained the level of post-secondary education at a four-year university. Using Seidman's three-part interview, six successful college attendees diagnosed with ADHD in childhood were interviewed. All participants described themselves as currently thriving. The major themes that emerged from this study were Recovery from Major Life Stumble, Offbeat Pathfinding, Positive Experiences with Authority Figures/Mentors, Thriving in Leadership Positions, Advocating for Those More Vulnerable Than Themselves, and Professional Purpose & Passion. Implications are given for how findings might help educators and other professionals foster resilience and success in students with ADHD.

Keywords: attention deficit hyperactivity disorder, post-secondary learners, resilience, academic persistence, qualitative interviews, coping

Beating the Odds: How Six Post-Secondary Learners Overcame Common Challenges of Attention Deficit Hyperactivity Disorder

Persons with Attention Deficit Hyperactivity Disorder (ADHD) are 11 times less likely to attend a four-year university than their neurotypical peers (Kuriyan et al., 2013). Students with ADHD are often highly intelligent (Katusic et al. 2011; Costa et al., 2014), therefore the low university attendance rate is likely attributable to other factors. The literature reviewed here focuses on non-academic strengths and strategies that promote success in those with ADHD.

Maslow and a host of other educational giants have long established that social and emotional turbulence can derail otherwise promising students and cause them to disengage with school work (Gawel, 1997). Students with ADHD struggle to regulate their emotional lives and behaviors in social settings (Kristensen et al., 2014). Poor emotional repair, skill gaps, externalizing behaviors, improper stimulation, deficits in social learning, stereotype threat, and bullying have all been found to make learning in the mass education system difficult for students

with ADHD (Barkley, 2015; Unnever & Cornell 2003; Wise et al., 2019). These non-academic barriers combined with difficulties in organization, focus, and impulsivity can lead to a student with ADHD giving up on school. Repeated failures can decrease resilience. Decreases in resilience cause people to be less willing to take risks, such as entering higher learning institutions (DuPaul & Langberg, 2015; Rutherford et al., 2008).

Much of the literature surrounding ADHD focuses on the failures of those with ADHD and ignores successes and accomplishments (DeWitt, 2020). Resilience, one of the most critical factors in academic success (Modesto-Lowe et al., 2011), is more likely to be promoted by a strengths-based approach than a deficit-based approach (Climie & Mastoras, 2015; Litner & Mann-Feder, 2009). Adults with ADHD have demonstrated a willingness to pay extra for strengths-based therapy. Schrevel et al. (2016) found that persons with ADHD frequently chose to forego free and insurance-covered treatment centers in favor of costly private coaching centers. When interviewed, participants explained that they preferred the strengths-based approach of the private centers to the deficits-based approach of the clinics.

One method for examining strengths is to describe the lived experiences of adults with ADHD that have successfully graduated from the school system with enough self-confidence and resiliency to attempt the college experience. Only a handful of studies have examined the lived experiences of adult learners with ADHD. Of these, many focus primarily on the deficits experienced by those with ADHD, such as core symptomatology and well-documented struggles in social, emotional, and academic domains (Driggers, 2013; Johnston, 2013; Lux, 2016).

Several studies have interviewed young adults about their successes in higher education. McKeague et al. (2015) found that college students with ADHD overcame their internalized self-stigma by embracing being “strange” and seeking out others considered strange. Gallo et al. (2014) interviewed college students with ADHD about how the K-12 education system prepared them for college. Participants reported that authority figure support was critical. They described the importance of becoming self-advocates. They also chose classes that had high levels of social learning, group work, and hands-on learning. Shattell et al. (2008) interviewed college students with ADHD about their childhood school experiences. Participants identified that their parents were very academically supportive, which helped offset some of the academic negatives associated with ADHD. These students talked about how it was easier to manage their ADHD symptoms once they had names for the phenomenon they were observing in their lives. Key strategies they used included extended time on tests, reduced distractions, typing instead of hand-writing, rewriting notes at home, and recording lectures so they could relisten to them repeatedly. Given how few qualitative studies have focused on the strengths of students with ADHD, further examination of school-related successes may yield generalizable strategies.

This study aimed to examine the lived experiences of adults with ADHD who have participated in post-secondary education, with an emphasis on success strategies and growth experiences. Since topics relating to core symptomatology of ADHD are extensively covered elsewhere (American Psychiatric Association, 2013; Barkley, 2015; Emmers et al., 2017), this study did not focus on well-established common ADHD experiences, such as attentional and organizational struggles. The study is focused on the strengths, strategies, and experiences not extensively explored in previous literature.

Methods

A qualitative method was chosen for this study because it allows for those with ADHD to present their own views and experiences, assign them meaning, and produce new insights (Yin, 2011). Six participants were recruited using snowball sampling, which provided the opportunity to identify subjects with different approaches to overcoming challenges and achieving success. They were interviewed using Seidman's three-part interview technique (Seidman, 2006). Recruitment began with individuals personally familiar to the Principle Investigator (P.I.), who has ADHD herself. Inclusion criteria were: at least 18 years of age, having had ADHD symptoms before the age of 12, having a formal ADHD diagnosis, having attended a four-year university and either in the process of completing that degree, had completed a degree, or previously attended college and now having full-time employment in a competitive field. Participants had to perceive themselves as successful and have at least one future career ambition. Interviews took place in private settings convenient to the researcher and subject; some were in-person, and some were by zoom or skype.

This process resulted in two male and four female participants, four of whom were interviewed during their undergraduate program, while two were several years into their careers. All participants came from two-parent middle-class families and were majority white. All but one had at least one college-educated parent.

Table 1
Participant characteristics

Nickname Selected by Participant	Age Range	Gender	Time of ADHD Diagnosis	ADHD Med- ication use in college	Point in education at the time of interview	Field of Study/Work
Garku	18-21	M	elementary school	yes	Final Semester in College	Education
Zoat	22-30	M	high school	partial	Early Career	Pastor
Lillyandrea	18-21	F	elementary school	yes	Freshman	Undeclared
Dibby	18-21	F	middle school	yes	Senior	Education/ ESL
Inya	22-30	F	elementary school	partial	Early Career	Computer Science
Falcanna	>30	F	college	yes, once diagnose d	Post Doctorate, Middle Career	Nursing

The study was approved by the university IRB. After obtaining signed consent, the lead investigator interviewed each participant on video for three 90-minute sessions separated by at

least a week, following Seidman's interview method. These interviews were transcribed and coded for themes between interviews using Five Phase Inductive Coding (Seidman, 2006). A final 30-minute session served as a member check and debriefing session with each of the participants. To protect confidentiality, identifying information was removed from the results, and participants were allowed to choose a fictitious name used to discuss their themes.

Iterative inductive analysis was used to identify themes and categories. Only those themes that were common across the narratives of at least three participants are reported.

Initial interview prompts were:

1. How did you become a college student?
2. What particular difficulties and successes did you encounter after you entered college?
 - a. Do you still struggle with any of the challenges you mentioned?
 - b. Are there any you feel you have conquered?
 - c. What is/was your social-emotional life like during college?
 - d. Can you describe to me some of the strategies you (would) use to help yourself through a difficult time?
 - e. What strategies do you feel you lean(ed) on the most?
3. What does it mean to you to have attended college?
 - a. Given what you have said about your experiences, how do you feel about your time in school?

Results

Table 2:
Summary of major themes and Implications

Theme	Examples	Implications for Educators
Recovery from Major Life Stumble: participants with this theme all overcame a trial that threatened their ability to function optimally.	Falcanna discovered she was under-prepared at her dream job; she found creative ways to catch up and succeed.	Focusing on developing strengths during difficulties may help those with ADHD find a way forward after life stumbles.
Offbeat pathfinding: those with ADHD often have to find unusual paths to success.	Garku found that if he sped up the speed of audiobooks, he could concentrate better and learn the material.	Those with ADHD may benefit from looking for an unusual way to complete requirements. Adding challenges or creativity to a task might place it in the zone of optimal stimulation for a learner.
Mental Breaks: participants sometimes had their minds go blank	Lillyandra explained, "I shut down the thinking portions of my brain and	Students with ADHD may benefit from finding ways to constructively take mental breaks instead of having

intentional and unintentional during times of acute stress.	just...take a mental nap...My brain never stops moving. My body never stops moving. So those times when I just don't move...when I get those precious moments of nothing, I actually get rejuvenated."	mental breaks inflicted upon them. Zoning out may have meditative effects if appropriately utilized.
Reframing: participants often found ways of recontextualizing their work so that it better sustained their interest.	Zoat only began enjoying basketball once he began to think of blocking as a psychological game.	Students with ADHD might be able to find ways of reframing their school work so that it is more engaging to them
Influential Authority Figures: Fathers and mentors saw beyond the participant's limitations and helped them grow in their strengths.	Falnanna's talent for teaching only blossomed into a career because a mentor persistently pestered her about it for years.	Educators working with youth ADHD might find success focusing on encouraging the youth's using their strengths, particularly as a way for them to overcome their weaknesses.
Thriving in Leadership Roles: Some participants came to leadership by appointment, some became leaders because others followed them as they worked to improve themselves, but all participants that were leaders thrived in that role.	Zoat was the speaking captain for his high school basketball team, a manager at a restaurant, and then a pastor. Dibby became a flag captain despite her weak flag skills because she helped the other weak flag team members improve.	Leadership can be a place for those with ADHD to thrive if allowed to come into it naturally. Sometimes leadership roles can help people with ADHD find their 'calling.' Those with ADHD who work to improve themselves might naturally attract peers looking to better themselves in those same areas.
Advocating for Those More Vulnerable Than Themselves: participants found themselves standing up for and trying to promote the interests of the vulnerable.	Garku stopped his friends from bullying a special needs peer. Falcanna became a regional advocate for toddlers with obesity.	Advocating for others may be beneficial to the personal growth of those with ADHD, particularly when it comes to finding a career path. Students with ADHD might benefit from having service opportunities in the school or classroom.
Professional Purpose & Passion: participants chose professions that let them pursue both their passions and their ideals.	Zoat left his job as a restaurant manager because he realized he valued people more than he valued making a bigger profit.	When selecting their future profession, students with ADHD may find the most reward in pursuing a path that overlaps with at least one of their interests and deeply held ideals.

Out of 233 themes identified, 14 met the minimum standard of applying to 3 out of the 6 participants. These 14 were sorted into major and minor themes. Five minor themes were then eliminated for having no pertinence to a major theme or the personal growth of the participants. This left five major themes (Recovery from Major Life Crisis, Offbeat Pathfinding, Influential Authority Figures, Thriving in A Leadership Position, Advocating for Those More Vulnerable Than Themselves, and Professional Purpose & Passion) and four minor or subthemes, Mental Breaks, Reframing Tasks, Positive Paternal Experiences, and Memorable Mentor Experiences).

Recovery from Life Stumbles

In addition to the typical ADHD struggles with inattention and impulsivity, five out of six participants described significant stumbles in their lives---times when it looked like they were going to be permanently off the pathway to self-defined success, but instead they found their footing and kept moving forward toward their goals. These stumbles were severe enough to threaten their ability to persist in school. Triggering experiences ranged from traumatizing cross country moves in childhood to college suicide attempts.

Zoat's initial stumble began with experiencing culture shock when his family moved from the west coast to a small town in Middle America when he was in sixth grade. His post-move challenges were primarily social. Before the move, Zoat recalled that he was not much different from his typical peers before the move, but after the move, "I found myself in a culture of bullying. I thought, 'if I'm going to assimilate into this culture, I have to speak their language and they speak basketball; I don't yet'." Initially, he was bullied after joining the school basketball team. "I was willing to put up with just enough ridicule to survive." He found that basketball provided social acceptance and an outlet for his frustrations throughout middle and high school.

Despite erratic grades, Zoat was admitted into university due to high SAT scores. Zoat was not diagnosed with ADHD until his senior year in high school; he started on medications the summer before college. In college, Zoat struggled. He changed majors several times. He became very involved in extracurricular activities, writing skits, performing stand-up comedy, creating comic books, and working part-time. "On medications, my grades were SO much better, but I didn't feel like myself, and I couldn't just let my mind wander and write a story. I was terrible at creative writing on the meds." He stopped the medications sophomore year: "I loved feeling creatively complete again." His grades subsequently fell below the level to participate in his extracurriculars. He left college because he found it so miserable to do homework off the medications but could not live with how he felt on them.

Despite not finishing his degree, Zoat has twice achieved the level of success hoped for by many college graduates: decently paid jobs in their field of choice. Zoat became manager at a top store within his favorite restaurant chain. He left that position to acquire his dream job as the young adult pastor for a large church, a church serving a university with a robust seminary. In this position, he frequently mentors ministry students pursuing a degree to work in a position such as his, despite not having completed a degree himself. Zoat feels he is currently leading his dream life; he loves his work, loves his wife and little boy, and loves that he can provide for them while serving his God full time.

Dibby also had a traumatizing move from the west coast to middle America. “[Moving] was actually a major upheaval for me....once we moved, I started really struggling with classwork,” with increasing manifestations of ADHD and dyslexia symptoms. Dibby also reported significant social difficulties post-move. “I felt like everybody else had the [social] rulebook and they forgot to give me mine.” Dibby expressed dissatisfaction with most of the friends she made after the move, describing many of them as talking down to her or influencing her to begin self-harming.

She was diagnosed with ADHD in middle school, and her academics improved after starting on medications, but her social and emotional struggles continued to worsen throughout middle and high school. She self-harmed (cutting) as a way of asserting a form of control in her life.

"I believe that almost anything/everything we do links back to a need for control. I didn't really feel like there was any way I could change my situation. I couldn't make myself better."

Both ADHD and anxiety contributed to this feeling of being out of control.

In college, feelings of social isolation and lack of control culminated in a depression that led to a suicide attempt during finals week of her freshman year. At the last moment, she phoned the hospital, who pumped her stomach. She took a leave of absence from college for a year and began psychiatric treatment and counseling. After a year of therapy, medications, self-improvement, and working with her mother at a preschool for children from vulnerable populations, she felt comfortable re-entering college and successfully obtained her degree.

Garku, a self-described "narcissist with self-esteem issues," experienced a crisis of self-confidence that almost caused him to drop out of college. He had struggled with writing as a child with dyslexia but learned to love storytelling and then fiction writing as a means of fulfilling his creative leanings. However, his history with ADHD and dyslexia made him fear he would not be able to compete academically in college. He compensated for these deficits until his junior year of college, when he received subpar grades in his major classes. "I had been trying to compete against readers and writers without being able to effectively read anything." Instead of dropping out, he switched majors for a term, going from pursuing an English teaching degree to pursuing a Spanish teaching degree. His self-declared talent for foreign languages fell short when more formal readings were assigned, leading to further subpar grades. The workarounds he developed for his "Teaching Shakespeare" class rekindled his self-confidence as well as his passion for teaching and literature. This passion motivated him to finish his original degree and graduate with honors.

Inya's personal crisis caused both her worldview and her ambitions to change. She was first runner-up in the selection process for West Point, a goal she had been working toward since 7th grade. After failing to be admitted to West Point, and a series of family losses, she became disillusioned with the military, lost her faith in God, and became a computer science major at a local university instead of reapplying to West Point. She described this time in her life as the point when she chose to dedicate herself to the pursuit of logic.

Falcanna's major life stumble came after she obtained an Associate's Degree and began her dream job. From the age of six, she had wanted to work in one exact place in one exact department. When she got the job, she discovered she was severely undertrained and that there was a culture of bullying that stigmatized asking for help. Underperforming and feeling unable to ask for help, Falcanna was on the verge of quitting her dream job. The turning point came when she decided, "You can bowl right over me 99% of the time, but this job was important to me. And once I set my mind on something, that's it. I can't be moved." Falcanna was able to find atypical methods for catching up and eventually excelled at her job. Since she understood from experience which areas could confuse newcomers, new employees thrived under her tutelage when she conducted orientations. She was soon placed in charge of orienting all new staff, including interning college students. She so excelled at this role that a supervising professor encouraged her to obtain further education and join the faculty. Falcanna eventually went on to obtain bachelors, masters, and doctoral degrees.

Offbeat Pathfinding

Four out of the six participants found atypical ways of circumnavigating a barrier in their life. After being incredibly bored by the bi-weekly assemblies at his school, Zoat asked a school administrator if he and his friends could incorporate skits to liven them up. Dibby turned an essay about her personal history into a rhyming poem that still met the word count requirements. Faced with failing grades in geometry, Zoat took a geometry correspondence course and earned an 'A.' Lilly independently located supplemental computer software to help her improve her geometry grade.

When Garku struggled with reading, he began using audiobooks for assigned reading. When the narratives would start to bore him, he would speed up the tempo of the audio playback. He found that his hyperactive mind would adjust to the increased speed and begin hearing the words as if they were spoken at a typical pace. This made the text more engaging to him.

When Falcanna tried to overcome her inadequate training at her dream job, she adopted some unusual improvement strategies. She purchased and studied doctoral-level textbooks on job-related topics. She surreptitiously followed around new employee orientations to get the information about workplace-specific procedures she had not been told or absorbed during her own orientation.

Mental Breaks

Three participants reported that they utilized a technique we refer to as 'mental breaks' to recover during or after periods of high stress. Lillyandeara describes this state as "mental naps", which are primarily voluntary for her: "I shut down the thinking portions of my brain and just...take a mental nap." When explaining the purpose of mental breaks, Lillyandeara said, "My brain never stops moving. My body never stops moving. So those times when I just don't move....when I get those precious moments of nothing, I actually get rejuvenated." After a taxing day with people, the introverted Falcanna will sometimes "just sit and look at the walls for an hour at least, before I can even read a book." So for Falcanna, the breaks are rejuvenating but not always voluntary.

Garku described a complex relationship with mental breaks. Initially, he described them as voluntary, a time "to de-stress and get away from all the expectations that people have for you." Later, however, he stated, "It's not downtime: it's forced downtime---its meltdown. It's like I cannot continue any further."

When asked what he did during these mental breaks, he replied, "self-reflection," quickly followed by "nothing, absolutely nothing". The duration of the breaks varied significantly. In one sentence, he stated that he was just "taking a moment" but later described that the breaks could "go on for days and days". He talked about taking all day on Saturdays "to do nothing, absolutely nothing".

The effect of mental breaks on Garku's self-esteem varied as well. At the end of his interview, he explained, "If I am ever really happy with myself, it's because I am taking Saturdays off." Nevertheless, he described his mental breaks as, "My brain, my body, my will, my spirit, all of what I am will not let me continue--I just crash." He reports that at the tail end of his breaks, "I feel like a failure, how can I not after I have just crashed and burned?"

He described the mental breaks as having contrasting effects on his efficiency. On the one hand, they help him feel refreshed. On the other hand, the high opportunity cost of giving up doing creative things in order to do nothing on days off was not sustainable for him in the long term.

"While I might be getting done the stuff that other people want me to do because I am taking a day every week to de-stress, [which then makes me] ready on Monday to do what people want me to do again, I am not doing the stuff that I want to do [writing stories, drawing, recording videos], so that eventually burns [me] out too."

Despite him identifying taking a mental break as one of his primary strategies for coping with depressive moods, extended mental breaks frequently incited negative self-attribution, which lead to more depressive moods--a problem he struggled with chronically.

"Having all that pressure put on me to do stuff that other people want me to do, combined with not getting done that stuff that I want to get done, usually just makes me shut down. I'll just... take [some time] and just collapse and get sad about life for a day or two, and put off all the stuff that other people want me to do. After a while I'll be ready to do it again, and then the cycle will repeat."

He explained that he typically extracted himself from this cycle by procrastinating until deadlines forced him into action.

Reframing

Three of the six participants had a habit in their lives of reframing tasks to make them more interesting by adding elements of creativity or finding a new way of looking at the assignment. Dibby frequently reframed her assignments as exciting and creative by injecting additional elements of creativity or excellence in her assignments. "Usually, if I had approached something creatively, I was proud of it," she explained. When she was proud of her work, she would be less self-conscious and more tenacious. Lillyandeara reframed difficult-to-remember Spanish

conjugations as humorous visuals or puns to aid her recall, making the learning process, if not actually fun, "at least not terrible". Zoat thrived when he was able to find a unique angle on an activity. When he first joined the basketball team, he was a weak sportsman who had lots of trouble getting his head around the game's minutiae. Basketball finally clicked for him once he began seeing the psychological side of basketball. "I can trick people [when blocking a shot, feinting, etc.]... I realized that I can be in people's heads! And there is a crowd here [for me to perform for]. Ooooooh!" This reframing helped him be a better ball-player and enjoy the game more. "It [was] my sincerest delight when someone wanted to take their shot, for me to disagree with them enough to send them packing [mimics blocking a basketball going into the hoop]." Despite being "terrible at scoring, I had more blocked shots than probably anybody in my school history."

Influential Authority Figures

Positive Paternal Experiences

The same three participants who had strong experiences reframing tasks, Zoat, Lillyandeara, and Dibby, specified that their fathers contributed significantly to their academic success. For two of those participants, Lillyandeara and Dibby, their fathers played a role in helping them to reframe those tasks. Lillyandeara's father is the one who introduced her to using puns as a fun memory aid. Dibby's father was her role model and partner in spicing up her assignments.

Zoat cites his father as one of the most notable reasons he did so well in the geometry correspondence course. He helped his son use billiards to understand geometry. He also understood his son's learning rhythms.

"My dad knows how to communicate with me better than anyone. [He'd] go 'hey bud, this is what we have to do now' and dial me in. He knew when I needed breaks. He knew when I needed to, you know, really go at it. He knew when I needed to go decompress."

Zoat's father identified effective decompression strategies for him to utilize, such as beating up an inflatable punching bag. "It was my way of having an outlet where I could essentially subdue the environment around me."

Memorable Mentor Experiences

Three out of six participants had mentors in their lives who took the time to see their potential and draw out the best in them. For Lillyandeara, it was a teacher who figured out that her deteriorating attitude and performance were related to grieving for her grandfather, who had recently died. He gave her space to talk about him and process her grief, which helped her refocus.

Zoat's high school basketball coach was an important mentor who helped Zoat come into his own while playing basketball. "He was someone that always sincerely wanted to figure out how to get the best out of you." During a game where Zoat was committing more fouls than usual, his coach asked what was going on. Zoat responded, "I just want to be creative. I don't know how to do that [on the basketball court]. I'm just letting off steam right now." The coach responded by encouraging him to "go make something up," i.e., be creative on the court. Zoat promptly

came up with a new move to fake out his opponent. The coach “called out ‘that was creative!’; he literally he used my word!” Zoat's coach also recognized his ability to speak for the team to the referees and made him a team captain, despite being the lowest scorer for his team.

Falcanna had a professor notice her budding talent for teaching students and encouraged her to go back to school so she could utilize this talent to become a college instructor.

"I think it took her probably two or three years to push me into it. [After a while], I thought, 'maybe I am good at something'. That was an aha moment for me: having other people see strengths in me was major for me."

Thanks to this encouragement, Falcanna went back to college to earn the required degrees to teach. Eventually, she became the first master's prepared professional in her specialty in her home state. All three participants had their mentor help them transition out of a bad time in their life: Zoat from his post-move social slump, Falcanna from her job bullying, and Lillyandeara from her grandfather's passing.

Leadership

Another theme that emerged was participants thriving in leadership positions inside and outside of work environments.

Outside of Work Environments

All but two of the participants reported taking on leadership positions outside of work situations. Inya earned a leadership position in the Reserve Officer Training Corps (ROTC) in her high school through hard work and enthusiastic adherence to the exacting requirements of the organization. Post-college, she became the head organizer for a community of 90 hobby enthusiasts. Although he never held an official leadership position, Garku had a penchant for organizing his friends into group activities, such as producing videos together and trying to influence their behavior positively. Dibby became a leader in her high school flag team when her own lackluster skills motivated her to stay behind after practices to do extra exercises. Other mediocre performers saw her dedication and began following Dibby's routines. Zoat was named speaking captain of his basketball team. He attributes his success in leadership to honing his natural ability to read people—a skill that served him well when he became a manager, and later, a pastor.

Inside Work Environments

All but two of the six participants chose to pursue professions centered on leading others or became a leader in their profession. Zoat spent time as both a manager directing employees and as a young adult pastor leading college students. As teachers, Garku and Dibby will be in charge of directing the actions of students and classroom aids. Falcanna's first leadership position came about in her first job when she was placed in charge of orienting new staff. Her second leadership position was as a manager of a small clinic. As a university faculty member, she has routinely held further leadership positions inside and outside her department. One of her most significant leadership roles was as a trailblazing advocate for treatment centers for toddlers with obesity.

Advocacy

Four out of the six participants reported that they had a formative experience advocating for the well-being of others. All four identified that their role as an advocate contributed to their career selection. Garku advocated for a special needs child bullied by his friends and later volunteered with peers with special needs, both of which contributed to his pursuit of a career in education. Falcanna identified and then advocated for treatment for obese toddlers who developed diabetes. Whenever Zoat saw that one of his employees was struggling, he would advocate for them with the owner. When Zoat realized there were needs that he could not meet as a restaurant manager, he became an ordained minister instead.

Dibby describes how she advocated for teachers to be more culturally and linguistically inclusive when communicating with Spanish-speaking preschool children and their families while volunteering/working at an inner-city preschool that served lower-income families. "I made it my mission to put in that extra step between like English immersion and Spanish bilingualism". In high school, she gave up her study hall, a rare opportunity to be in the same classroom as her circle of friends, to volunteer in the special needs classroom. That experience was instrumental in her choosing to major in education. "I guess it's probably a pattern. It's just like..seeing people who needed help [and helping them]".

Professional Purpose & Passion

Four of the six participants spoke about their professions with passion and described their chosen profession as having a higher-order significance. These participants drew a connection between their profession and their pursuit of the force they feel rightly governs the universe.

Passionate Interest

While all participants (except for Lillandrea, who had not decided on a major) spoke passionately about their chosen professional path, three participants directly demonstrated their passion by performing tasks associated with that profession without training or prompting. Garku, for example, made entertaining, educational videos in his free time, even before he decided to be a teacher. Zoat pastored his employees before he was a professional pastor. While Dibby was at home recovering from crippling anxiety and depression, she began to notice that English-as-a-second-language (ESL) students in the preschool where she volunteered were not receiving culturally-linguistically appropriate teaching practices. She took it upon herself to act as a makeshift ESL teacher by learning Spanish, bringing in culturally appropriate texts, and increasing the number of diverse representations in classroom media and objects. Upon returning to college, she switched to an ESL-early childhood education double major.

Connection to Causal Forces

Four participants described a connection between their professional pursuits and the higher power they feel governs the universe. They also described how that connection influenced their personal code of conduct. Inya, for example, believes that the world runs on logic. Inya stated, "I am obsessed with finding the unbiased truth behind things, whatever that truth may be." She seeks the truth through scientific logic and strives to be logical in all avenues of her life. She stated she found her job in Information Technology fulfilling because coding is intimately connected with pure logic. Inya also claimed that one of the biggest reasons she did not join the military is that she learned about military practices that she could not logically justify.

Zoat claimed that obedience to his God and biblical ideals drives much of his decision-making, including which profession he pursued. Initially, Zoat loved his work as a restaurant manager. He had a passion for food and even rose to a leadership position. He found ways to serve his God while working there, such as nurturing new employees and pursuing ethical business practices. However, these opportunities for "ministry", as Zoat called them, proved inadequate in the long run to fulfill his desire to care for troubled individuals. This gap was driven home for him when the business's priorities conflicted with the Christian God's mandate to help struggling people. Zoat was advocating for Danny, a struggling employee who was an impoverished single father.

"The owner of the restaurant called me in one day and he goes 'Hey, you're going to need to let Danny go'. I said 'Hey listen, I know that he's exceeded his warnings, I get that. But this is my ministry to Danny! He's going to be okay: he's coming to church, we're working on getting some counseling for him...and he's in a [tough place], and we need to be conscientious of that spot. And the owner goes, 'I know, but right now he's just not functioning well--- he's not. He's late. He's been late more than enough. We're setting a bad example for the others'. And I just kept insisting, 'I get it, but I know what Danny needs-- and right now, for me, this is about Danny! And the owner says, 'well--sometimes it just has to be about the chicken'."

The insight that, unlike himself, private enterprise cared more about products than people--led him to leave that job. Shortly after that, he became a full-time young adult pastor. He reported that this made him much happier and more satisfied in his work.

Dibby felt called by her God to serve marginalized children. Garku also believed in the Christian deity and reported that being an educator will be an act of service to his God.

Discussion

Recovery from Major Life Stumble

All of our participants demonstrated an admirable resiliency in the face of hardship. They all overcame some significant setback that might have completely derailed other individuals into long-term unemployment, drug use, or unwanted pregnancy (Clayborne, 2019; Mahon & Yarcheski, 2001). They did not all arrive at success without detours or stumbles, but they all reported feeling personally successful.

Each participant reported themselves as happier with the person they are now than the person they were before they experienced their various life crises. Inya, for example, claims, "I find it hard to even get in the head of the person I was back then...I like the way I am now". They each perceived themselves as successful at the time of the interview. Self-reporting success despite setbacks is an important indicator of self-efficacy and persistence associated with enhanced success (Barling & Beattie, 1983; Sadri & Robertson, 1993).

In college students with ADHD, overconfidence (positive illusory bias) has sometimes been reported (Prevatt et al., 2012). Since this study's data collection is based entirely on self-reporting, there is a possibility that participants' success is merely an example of positive illusory

bias rather than genuine self-actualization. However, in the case of our particular participants, their self-defined success appears grounded in tangible career success and/or academic success.

Offbeat Pathfinding

An effective set of coping techniques is one of the keys to college success among those with ADHD (Sedgwick, 2018). However, students with ADHD often lack coping flexibility (Babb et al., 2010). Since five of our six college attendees employed creative coping strategies, this may indicate that one of the hallmarks of a successful person with ADHD is the ability to find creative workarounds. Other studies have also described their participants with ADHD finding unusual ways to turn their weaknesses into strengths. For example, one study found that students with ADHD used the 'stress of procrastination'-- typically a negative influence --as a motivator (Kaminski et al., 2006; Cerino, 2014; Rice et al., 2012).

The theory of optimal stimulation suggests that boredom results from disengagement due to a stimulus either not being stimulating enough or being too stimulating to properly process (Leuba, 1955). Those with ADHD are particularly prone to seek additional stimulation when activities are not stimulating enough (Zentall, 1975). Garku, Dibby, and Zoat all found ways to keep themselves engaged with mandatory activities by increasing the amount of stimulation they were getting from that activity. Dibby added complexity, Zoat added creativity, and Garku sped up his audiobooks. Speeding up the audiobooks to match his cognitive tempo is consistent with research about optimal stimulation (Antrop et al., 2000).

Falcanna's solution to lacking training was similarly innovative. Not only did following the interns allow her to gain much-needed information, but it also allowed her to bypass the stigma associated with help-seeking behavior. Navigating stigma is a significant obstacle for students with ADHD and not always one they are well equipped for (Hoza, 2007).

Mental Breaks

At first glance, the mental breaks described by participants appear to be akin to meditative emptiness, a strategy sometimes recommended for those with ADHD (Mitchell et al., 2017; Zylowska et al., 2008). It is also possible that these mental breaks are the acute stress response "Freeze". Freeze is the highest level of the automatic systems' fight-flight-freeze trio, triggered by stress (Aidman & Kollaras-Mitsinikos, 2006; Schmidt et al., 2008). Given that those with ADHD are more likely than their typical peers to experience flight-fight-freeze, it would be unsurprising if participants experienced bouts of freeze (Beauchaine et al., 2013; Morris et al., 2020; Musser et al., 2011; Pang & Beauchaine, 2013). A third related possibility is that the mental breaks are an overcorrection that occurs when downregulating the mental/physiologic stress response. Instead of being frozen with fear, they are stuck in neutral. Since students with ADHD struggle with self-regulation, it may be more difficult for them to leave this neutral state than their typical peers (Barkley, 2011). Maladaptive mental breaks could be overcorrections, where the person gets stuck in neutral gear, accidentally undermining effortful control (Martel & Nigg, 2006). However, these hypotheses are less likely because participants have identified *instances where they deliberately invoke this tool*. A few even describe it as a natural reaction to stress.

A key question then becomes: Are the mental breaks beneficial coping strategies or non-productive time-suckers undermining success? Both may be true. Maladaptive breaks seemed to be longer for some participants, lasting for hours/days instead of short bursts. Excessive negative intrusive thoughts during these breaks caused self-efficacy to diminish. Choosing to take a break seems to have been a more positive experience than waiting until they had no choice but to take a break.

Creative Reframing

Reframing has been well established as a beneficial method of coping (Lambert et al., 2009; Moore et al., 2010; Scheier et al., 2001). Studies have demonstrated that Adults with ADHD are better than their typical peers at divergent creative thinking, a type of thinking known to promote finding multiple solutions to a problem (Acar & Runco, 2019; White & Shah, 2006). Participants described achieving success and a sense of pride when they developed a new paradigm through reframing. They often went on to excel in the area they reframed. Research suggests this may be because of the increased sense of investment and ownership that customizing something often bestows (Lengnick-Hall & Sanders, 1997; Williams & Williams, 2011). Students with ADHD often struggle to maintain engagement, and one way to effectively increase engagement is to increase the student's sense of ownership over schoolwork (Junod et al., 2006; Lengnick-Hall and Sanders, 1997; Williams, & Williams, 2011). An increased sense of ownership overactivity has been shown to yield better results (Stefanou et al., 2004).

Influential Authority Figures

Four of our participants described authority figures, such as teachers and coaches, not only bonding with them on a personal level but also taking the time to see beyond their limitations. These authority figures encouraged participants to embrace and enhance what made them unique and strong. Past research has found that students with ADHD often experience conflict with authority figures, such as teachers (Kos et al., 2006). However, Gallo et al. (2014) and Shattell et al. (2008) found that authority figure support was critical to academic success among their participants.

A large body of research has demonstrated that parental influence is a significant predictor of achievement (Gordon, 2016; Latimer et al., 2003; Primack et al., 2012; Rogers et al., 2009; Shelleby& Ogg, 2020). Three participants talked about specifically their fathers supporting them academically. These findings differ from Rogers et al. (2009), who found that fathers of children with ADHD are less likely to be involved with their child's academics than the fathers of neurotypical children, and from Chang et al. (2013)--who found that students with ADHD were more likely to have harsh experiences with their fathers. All but one of our participants discussed their fathers positively.

Memorable Mentor Experiences

Our results are in keeping with research findings on the benefits of mentors for students with ADHD (Anastopoulos & King, 2015; Glomb et al., 2016). Lillyandeara's positive experience with her teacher helping her talk about her grief reflects educational best practice by looking at students' behaviors holistically (Armstrong, 1999). Zoat's coach and Falcanna's mentor saw strengths beyond their weaknesses. Falcanna's mentor saw beyond her associates' degree and spotted someone who had excellent teaching abilities. Zoat's coach took the time to learn that

beyond his poor shooting skills was a creative basketball player, skilled at the mental part of the game. These are revelations the participants might never have had on their own. The benefit of a strengths-based approach in working with those with ADHD is a common theme among ADHD advocates (Climie & Mastoras, 2015).

Leadership

There are very few academic articles on the subject of ADHD and leadership. Five of the six participants in this study described times in their lives when they thrived in a leadership role. These findings are counter to three previous studies that reported that secondary characteristics of ADHD, such as hands-off management styles, erratic organization, and struggles resolving peer conflict, obstructed effective leadership (Calleja-Pérez, & Muñoz-Jareño, 2011; Carleton & Barling, 2018; Realmuto, 2004).

Advocacy

There is no previous literature about trends involving persons with ADHD advocating for vulnerable populations to the researchers' knowledge. The presence of prosocial goals, such as advocating for others, among these participants with ADHD is in keeping with research about prosocial goals contributing to greater life happiness (Aknin et al., 2013; Weiss et al., 1971). The participants with this theme showed a heightened sensitivity to vulnerable populations and their needs. By contrast, other research has suggested that those with ADHD are less likely to be socially observant than their typical peers (Gardner & Gerdes, 2015; Uekermann et al., 2010).

Three of the four participants with this theme linked an instance of advocacy directly to an epiphany about their Professional Purpose & Passion.

Professional Purpose & Passion

Participants expressing this theme reported frequently finding satisfaction in their work. It is widely accepted that a sense of purpose increases work satisfaction (Hill et al., 2018). Four of six participants described that their career was, at least in part, an expression of their commitment to following a life- purpose-related goal.

Another variable often reported to increase work satisfaction is having a passion for the job or field. Jachimowicz et al. (2018), in their meta-analysis of 29 studies, found that grit (resilience) without passion did not improve performance. Since those with ADHD typically have lower resilience than neurotypical peers (Dvorsky & Langberg, 2016), passion may be even more critical for them than for their typical peers. Our participant's passion for their field coupled with their success agrees with these findings. If you follow your passions, you are more likely to find a satisfying career' is standard advice given to young people (Lajom et al., 2018).

Five of the six participants reported that their passion for serving their causal force enhanced their passion related to their field, possibly by giving their work an additional sense of purpose. An enhanced sense of purpose may have made work more rewarding, a valuable boon for those with ADHD since ADHD brains often have a malfunctioning internal reward system (Volkow, 2011; Weston et al., 2020). These findings align with theories about work satisfaction and longevity increasing with workplace passions and rewards (Savickas, 2008).

Intersection between Advocacy, Leadership, and Profession

For three of the four participants, the themes of Advocacy, Leadership and/or Professional Purpose & Passion were inextricably intertwined. For example, in Dibby's case, she was awakened to her Professional Purpose & Passion because of her experience advocating for Spanish-speaking families in the preschool, but it had nothing to do with her leadership time as a flag squad captain. Her themes of Advocacy and Professional Purpose & Passion are connected, but not her Leadership theme. Garku's themes of Leadership and Advocacy overlapped when he took leadership over his friend group to stop them from picking on a student with disabilities. Falcanna's Leadership and Advocacy have a circular relationship during significant portions of her professional career. If she had not been the supervisor at a clinic, she would not have been in a position to notice the toddler obesity problem, for which she eventually became a leading advocate. Her leadership gave her opportunities to advocate, and while advocating she became a leader of advocates. Zoat has a similar connection between Leadership, Advocacy, and Professional Purpose & Passion. His first instance of advocacy was speaking to officials on behalf of his team during basketball disputes when he was the speaking captain in high school. He was appointed a leader because he showed he would make a good advocate. Later on, as a workplace manager, he had opportunities to advocate for disenfranchised employees like Danny. These experiences caused him to realize that his true Professional Purpose & Passion was as a pastor, i.e., a professional leader and advocate.

The interconnection of Advocacy and Professional Purpose & Passion is in keeping with previous research that discusses that prosocial life goals contribute to higher life satisfaction (Bronk & Finch, 2010; Mariano & Vaillant, 2012). Bradley-Levine (2018) reviewed the connection between advocacy and leadership; she theorized that, pedagogically speaking, advocacy is a practice of leadership. No research was found that connected the intersection of these three elements with ADHD and academic success.

Limitations

The small number of participants and limited economic and cultural diversity of the participants limit the generalizability of the study. As a qualitative study, causality cannot be demonstrated, only hypothesized.

Implications for Future Research and Practice

Since this study investigated only those persons with ADHD who self-reported academic and/or career success, future research could compare the lived experiences of those students with ADHD who did not experience success. A longitudinal follow-up of adults with ADHD who are successful would also be beneficial.

One implication for practice is that focusing on the strengths rather than the deficits of those with ADHD may help them persevere. There was a pattern of “turning weaknesses into strengths” in this study. Specific participant experiences suggest specific ways to do that. Falcanna learned the skills she would need to be a good teacher while overcoming her initial knowledge gaps; one way to apply this in the classroom could be to offer students previously weak in an area opportunities to tutor younger students in that area. Dibby inspired diligence in others by her

own persistence; students with ADHD might benefit from having their slowness on an assignment publicly recontextualized as triumphant persistence. Zoat consciously chose to focus on his skill in blocking rather than his weakness in making baskets; educators can coach students with ADHD to find nodes of talent within a network of struggles. Garku's love of storytelling inspired him to become a language arts teacher, despite his vocabulary and spelling weaknesses. Educators may be able to inspire similar persistence in their students by habitually engaging their student's creativity. Engaging the student's creativity in an assignment may also increase how stimulating the activity is--pushing the student toward their zone of optimal stimulation. Many participants creatively increased their engagement with learning in problem areas; educators may find it beneficial to foster creative problem-solving skills in their students with ADHD. Research is needed on effective strategies to encourage students with ADHD to generate and use those creative solutions. Research is also needed to verify if specific strategies used by participants to increase their stimulation, such as Garku speeding up the audiobooks, can be generalized for use by other students with ADHD.

The theme of mental breaks can have implications for educators as well. Zoat's father utilized Zoat's mental breaks to prevent burnout during difficult instruction. Since none of the participants were taught how to use mental breaks, they may have a cultivable natural talent for it. Garku's experience hints that freedom from expectations may be a key to effective mental breaks. If so, mental breaks may be difficult to teach using traditional methods, since teaching a skill generally involves placing expectations upon learners. A more effective strategy might be to identify and then cultivate the pre-existing mental break habits of students with ADHD. An important question for further research would include, 'how can teachers and parents promote productive instead of maladaptive mental breaks?'

Several participants illustrated the power of an authority figure identifying a strength and then helping a student generalize it. Parents, teachers, and other mentors can be encouraged to note when their ADHD students are excelling and learn to read their children's need for a mental break. Several of the participants had fathers who helped them reframe weaknesses and find unique paths to learning. Future research could investigate whether a correlation between successful students with ADHD and strong paternal influence holds true in a wider sample.

A meaningful theme among most participants was a connection between Advocacy, Leadership, and Professional Purpose & Passion. It would be worthwhile to study whether this connection holds true among a larger sample size. If so, how can advocacy, leadership, and Professional Purpose & Passion be effectively promoted among students with ADHD?

Conclusion

Much work is still needed to establish best practices for helping the ADHD population at all ages. Helping students with ADHD foster resilience by aiding them in the process of turning their strengths into weaknesses through creative problem solving may help those with ADHD gain the confidence and independence they need to enter college and be successful.

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